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ABSTRACT

Developed to help educators locate microcomputer software programs they may want to preview for students in grades K-12, this guide lists commercially available instructional software programs that have been favorably reviewed by members of the Educational Software Evaluation Consortium. Programs are arranged alphabetically by title within curriculum areas: art; business education (accounting/bookkeeping, economics, and typing); computers; electronic periodicals; health, instructional tools (authoring system, classroom management, database, graphics generator, instructional materials generator, spelling checker, spreadsheet, student study aid, telecommunications, and word processor); keyboarding; language arts; library media skills; mathematics (advanced mathematics, algebra, geometry/measurement, number, problem solving and statistics); music; preschool/early childhood; problem solving/logic; science (astronomy, biology, chemistry, earth science, environmental education/ecology, general science, physics, and scientific method/lab equipment); social science (economics, geography, government/political science, history, and sociology); tests and testing; vocational education/industrial arts; world languages (French, German, Spanish, and language tool). Information provided for each program includes the title, publishers, computer and instructional mode specifications, grade level(s), price, and a very brief annotation. A list of review participants, abbreviation keys, an alphabetical list of titles, publishers' addresses, 11 articles and a policy statement on software use, review, and evaluation, eight of which are reprints from Computers in Composition Instruction or The Computing Teacher are also included. (EW)

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The 1988-89 Educational Software Preview Guide

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at the
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May 9-12, 1988

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PREFACE

The 1988-89 Educational Software Preview Guide includes a list of favorably reviewed microcomputer software for instructional use in preschool through grade twelve. It is NOT a buying guide. It has been developed solely as an aid to educators in locating programs they may want to preview. The Consortium's participants recommend that all software be previewed by educators to determine its suitability for their instructional programs and students.

The 1988-89 Educational Software Preview Guide has been developed by the Educational Software Evaluation Consortium, which represents 29 organizations involved in computer education throughout North America. The programs listed in this guide have been favorably reviewed at participating sites. Placement of a title on a list and into specific subjects, grade levels, and instructional modes reflects the best judgment of the Consortium's participants.

This guide is not all-inclusive. It includes only commercially available instructional software. Titles not included in the guide fall into the following categories: not yet widely reviewed, not readily available to review, unfavorably reviewed, or outside specified categories (e.g., multimedia materials). Each edition of the guide is an independent publication and includes titles from earlier editions only if they meet the criteria established for the current year.

Development of *The 1988-89 Educational Software Preview Guide* was the major purpose of the California Software Evaluation Forum, held at Vallombrosa Center in Menlo Park, California, May 9-12, 1988. The Forum was sponsored by the California Software Clearinghouse in the San Mateo County Office of Education. The California State Department of Education funded this project as one activity of the Office of Educational Technology. Additional financial support for the Educational Software Evaluation Consortium was provided by Phi Delta Kappa and the participating organizations. Technical consultant for the project was Lary Smith, Wayne County ISD, Michigan.

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How to Use the *Preview* Guide

The *Preview Guide* is useful for locating software for a particular curriculum area, grade level and machine. You can check under "Preview Guide by Curriculum Area" to locate any appropriate software. If you are interested in

a program, the "Addresses of Publishers" section has the necessary information to order a catalog or the software for preview if possible. (Many publishers now have preview policies.)

If you are already interested in a piece of software, check for it under "Preview Guide-Titles and Prices" as another possible source of information of the software. Keep in mind that the absence of a title from this list is not to be interpreted as a negative judgment. Many excellent packages may not have been widely reviewed by the time of this forum, and the rate at which excellent packages are appearing seems to be increasing.

Use of the *Preview Guide* by Software Developers

The *Preview Guide* is also useful for developers of educational software. They can use the *Guide* to identify curriculum areas, grade levels within curriculum areas, or machines where there is little favorably reviewed software and then direct their efforts toward these areas or machines.

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KEY TO ABBREVIATIONS

SUBJECT ABBREVIATIONS

AT	Art
BE - AC	Business Education - Accounting/Bookkeeping
BE - EN	Business Education - Economics
BE - TY	Business Education - Typing
CS	Computers
EP	Electronic Periodicals
HL	Health
IT - AU	Instructional Tools - Authoring System
IT - CM	Instructional Tools - Classroom Management
IT - DB	Instructional Tools - Data Base
IT - GG	Instructional Tools - Graphics Generator
IT - IM	Instructional Tools - Instructional Materials Generator
IT - SK	Instructional Tools - Spelling Checker
IT - SD	Instructional Tools - Spreadsheet
IT - SA	Instructional Tools - Student Study Aid
IT - TC	Instructional Tools - Telecommunications
IT - WP	Instructional Tools - Word Processor
KB	Keyboarding
LA	Language Arts
LM	Library Media Skills
MA - AD	Mathematics - Advanced Mathematics
MA - AL	Mathematics - Algebra
MA - GM	Mathematics - Geometry/Measurement
MA - NU	Mathematics - Number
MA - ST	Mathematics - Statistics
MU	Music
PR	Preschool/Early Childhood
PS	Problem Solving/Logic
SC - AY	Science - Astronomy
SC - BL	Science - Biology
SC - CH	Science - Chemistry
SC - ES	Science - Earth Science
SC - EE	Science - Environmental Education/Ecology
SC - GS	Science - General Science
SC - PH	Science - Physics
SC - SM	Science - Scientific Method/Lab Equipment
SS - EC	Social Science - Economics
SS - GE	Social Science - Geography
SS - GO	Social Science - Government/Political Science
SS - HI	Social Science - History
SS - SO	Social Science - Sociology
TE	Tests and Testing
VE	Vocational Education/Industrial Arts
WL - FR	World Languages - French
WL - GR	World Languages - German
WL - SP	World Languages - Spanish
WL - LT	World Languages - Language Tool

INSTRUCTIONAL MODE ABBREVIATIONS

AU	Authoring System
CA	Creative Activity
CP	Computer Programming
DB	Data Base
DE	Demonstration
DP	Drill and Practice
EG	Educational Game
GG	Graphics Generator
IF	Interface
IM	Instructional Materials Generator
PS	Problem Solving/Logic
SD	Spreadsheet
SH	Shell/Mini-authoring System
SI	Simulation
SK	Spelling Checker
TC	Telecommunications
TE	Test
TU	Tutorial
WP	Word Processor

GRADE LEVEL ABBREVIATIONS

P	Primary (K-3)
E	Elementary (4-6)
M	Middle (7-9)
S	Secondary (9-12)
T	Teacher

COMPUTER ABBREVIATIONS

AC	Acorn
AM	Amiga
AP	Apple
AT	Atari
CO	Commodore 64
IB	IBM PC
JR	IBM PCjr
MC	Macintosh
PE	Commodore PET
PS	IBM PS/2
TA	Tandy 1000
TC	TRS-80 Color
TR	TRS-80 Model III/4
VC	Commodore VIC

TIC RESOURCE GUIDE ABBREVIATIONS

F	Foreign Language
H	History–Social Science
L	Language Arts
M	Mathematics
S	Science
V	Visual and Performing Arts
E	Exemplary
D	Desirable

PRICE NOTATION

* in PRICE column indicates a series for which programs are also sold separately.

PUBLISHER ABBREVIATIONS

Abbreviation	Publisher
A.L.P.S.	Automated Language Processing Systems
ACTIVE LEARN	Active Learning Systems
ADD WES	Addison-Wesley Publishing Co.
ADOBE	Adobe Systems
ADV ID	Advanced Ideas, Inc.
AGS	American Guidance Service, Inc.
ALDUS	Aldus
ALFRED MUSIC	Alfred Publishing Co., Inc.
ALLEN BONADI	allen bonadio associates
APPLE	Apple Computer, Inc.
ASHTON TATE	Ashton-Tate
ATARI	Atari Corp.
BAUDVILLE	Baudville
BEAGLE BRO	Beagle Brothers
BEDFORD SOFT	Bedford Software, Ltd.
BLUE LION	Blue Lion Software
BORLAND	Borland International
BRITANNICA	Britannica Software
BRODERBUND	Broderbund Software
C & C SOFT	C & C Software
CACTUSPLOT	Cactusplot Company
CHALLENGER	Challenger Software Corp.
CHANCERY SOF	Chancery Software, Ltd.
CLARIS	Claris Corp.
COMMODORE	Commodore Computer Systems Div.
COMPRESS	COMPress
COMPU-TEACH	Compu-Teach
CONDUIT	CONDUIT-University of Iowa
CREATIVE PUB	Creative Publications
CREATIVE TEC	Creative Technology, Inc.
CRICKET SW	Cricket Software
DAVIDSON	Davidson & Associates, Inc.
DC HEATH	D.C. Heath & Co.
DECISION	Decision Development Corp.
DESIGN SCI	Design Science
DIDATECH	Didatech Software
DLM	DLM
EARTHWARE	Earthware Computer Services
ED TECH	Educational Technology
ED'L ACTV	Educational Activities, Inc.
EDUSOFT	EduSoft
EDUTECH	EduTech
ELECTR ART	Electronic Arts
EPYX	Epyx, Inc.

Abbreviation	Publisher
ETC	Educational Technology Center/Harvard Graduate School of Education
EXSYM	Exsym
FOCUS	Focus Media
FREESOFT	Freesoft Co.
GAMCO	Gamco Industries
GESSLER	Gessler Educational Software
GREAT WAVE	Great Wave Software
GROLIER	Grolier Electronic Publishing, Inc.
HARTLEY	Hartley Courseware
HAYES	Hayes Microcomputer Products, Inc.
HBJ	Harcourt Brace Jovanovich
HIGH TECH	High Technology Software Products
HOLT R&W	Holt, Rinehart and Winston
HOUGHTON	Houghton Mifflin Co.
HRM SOFTWR	HRM Software/ A Division of Queue, Inc.
HUMANITIES	Humanities Software
IBM	IBM Educational Systems
INNOVISION	Innovision
ISL SOFTWR	Island Software
KRELL	Krell Software Corp.
LCSI	Logo Computer Systems, Inc.
LEGO	Lego Systems, Inc.
LETRASET USA	Letraset USA
LIV TEXT	SYMANTEC/Living Videotext Division
LOTUS	Lotus Development Corp.
LRNG TECH	Learning Technologies
MARK DAVIDS	Mark Davids
MARSHWARE	Marshware
MCGRAW HILL	McGraw-Hill Book Co./School Division
MECC	MECC
MEDIAGENIC	Mediagenic
MEIZNER	Meizner Bussin Machines, Inc.
MENTOR LRN	Mentor Learning Systems, Inc.
MICRO P&L	Micro Power & Light Co.
MICROSOFT	Microsoft Corp.
MIDWESTPC	Midwest Publications, Inc.
MILLIKEN	Milliken Publishing Co.
MINDPLAY	Mindplay, Inc.
MINDSCAPE	Mindscape, Inc.
NASHOBA	Nashoba Systems, Inc.
NATIONAL GEO	National Geographic Society
NEWSWEEK	Newsweek, Inc.
OPTIMUM RES	Optimum Resource, Inc.
PAPERBACK	Paperback Software
PASSPORT	Passport Designs, Inc.
PRENTICE	Prentice-Hall Allyn and Bacon
PTI-KOALA	PTI-Koala

Abbreviation	Publisher
RAND MCNLY	Rand McNally & Co.
RANDOM	Random House School Division
SAVTEK CORP	Savtek Corp.
SCHOLASTIC	Scholastic, Inc.
SCOTT FORS	Scott, Foresman and Co.
SENSIBLE	Sensible Software
SHENANDOAH	Shenandoah Software
SILICON BEAC	Silicon Beach Software, Inc.
SILVER	Silver Burdett & Ginn
SIMON & SCHU	Simon & Schuster Software
SOFTSWAP	Softswap
SPINNAKER	Spinnaker Software, Inc.
SPRINGBOARD	Springboard Software
STYLEWARE	Styleware, Inc.
SUNBURST	Sunburst Communications
SVE	Society for Visual Education
SW PUB	South-Western Publishing Co.
TECH ED	Technical Educational Consultants
TEMPORAL	Temporal Acuity Products, Inc.
TERRAPIN	Terrapin, Inc.
TIME	Time Education Center
TLC	Learning Company, The
TOM SNYDER	Tom Snyder Productions
TRUE BASIC	True BASIC, Inc.
TYC	Teach Yourself by Computer Software, Inc.
VERNIER	Vernier Software
WILEY	John Wiley & Sons, Inc.
WORD PERFECT	Word Perfect Corporation

Preview Guide by Curriculum Area

ART

Title	Publisher	Computers	Modes	P E M S T	Price
see also INSTRUCTIONAL TOOLS - GRAPHICS GENERATOR section					
816/PAINT High resolution graphics package	BAUDVILLE	AP	CA,GG	- E M S T	75.00
ADOBE ILLUSTRATOR High level graphics development tool	ADOBE	AP,MC	CA,GG	- - M S T	495.00
ANIMATE High resolution program for creating detailed cell-style animation	BRODERBUND	AP	CA,GG	- E M S T	69.95
BLAZING PADDLES Tool for creating computer art; includes graphics library	BAUDVILLE	AP,CO	CA,GG	- E M S T	55.00
CERTIFICATE MAKER Design and print professional-looking certificates	SPRINGBOARD	AP,AT,CO,IB,MC	GG	- E M S T	39.95
COLOR ME:COMPUTER COLORING KIT Draw freehand, or color and cut-and-paste predrawn pictures	MINDSCAPE	AP	CA,GG	P E - - T	29.95
CREATE WITH GARFIELD Create cartoons with Garfield characters; can be printed	DLM	AP,CO	CA,GG	P E - - T	29.95
CREATIVITY UNLIMITED Develops flexible and original approaches; building, rotating, and expanding objects	SUNBURST	AP	CA	- - M S -	65.00
CRICKET DRAW Graphics development tool	CRICKET SW	MC	CA,GG,IM	- - M S T	295.00
DAZZLE DRAW Uses mouse interface to create computer art similar to art from the Macintosh	BRODERBUND	AP	CA,GG	P E M S -	59.95
DELTA DRAWING Create images by using simple commands	SPINNAKER	AP,AT,CO,IB	CA,CP,PS	P E M - -	49.95
DISNEY DESIGN STUDIO Create greeting cards and invitations with Disney cartoon characters	SUNBURST	AP	CA,GG	P E M - T	75.00
DRAW-IT Create and manipulate designs	PAPERBACK	IB	CA,GG	- - - S T	29.95
ELECTRIC POET Authoring system with color, graphics, animation, and print capabilities; electronic presentation	IBM	IB	AU,CA	- E M S T	75.00
FACEMAKER Encourages memory and creative skills by creating and remembering facial features	SPINNAKER	AP,AT,CO,IB,JR	CA,DP,EG	P E - - -	29.95
FANTAVISION 'Tweening' creates up to 64 animated sequences for each picture drawn by user	BRODERBUND	AP	CA,GG	- - M S T	59.95
FULLPAINT Drawing program similar to MACPAINT, but with scroll bars and other advanced features	ASHTON TATE	MC	CA,GG	P E M S T	99.95
GRAPHICS EXPANDER V.1 Editing tool and 300 graphics for use with *PRINT SHOP*	SPRINGBOARD	AP,IB	GG	P E M S T	39.95

Title	Publisher	Computers	Modes	P E M S T	Price
GRAPHICWORKS Desktop publishing package	MINDSCAPE	MC	GG	- - - S T	149.95
KOALAPAINTER Graphics used with nursery rhymes; requires Koalapad	PTI-KOALA	AP,AT,CO,JR	CA,GG	P E M - T	29.95
MAC 3D High resolution graphics program features three-dimensional figures	CHALLENGER	AP,MC	CA,GG	- - - S T	195.00
MACDRAW Graphics development tool for creating structured graphics and drawings	CLARIS	MC	CA,GG	P E M S T	195.00
MACPAINT General-purpose graphics development tool	CLARIS	MC	CA,GG	- E M S T	125.00
MACVISION Capture video images on the computer screen via a video camera; can print images	PTI-KOALA	MC	CA,GG	- E M S T	349.95
MR. PIXEL'S CARTOON KIT Create animated cartoon graphics	MINDSCAPE	AP,CO,IB	CA,GG	P E M - -	39.95
MR. PIXEL'S PROGRAMMING PAINT SET Create, design, and credit pictures on computer screen; can print pictures	MINDSCAPE	AP,CO,IB	CA,GG	P E M - -	39.95
NEWSROOM Desktop publishing program for flyers and newsletters; includes instructional support materials	SCHOLASTIC	AP,CO,IB,JR	CA,GG,IM,WP	- E M S T	74.95
NEWSROOM CLIP ART V.1 600 graphics for use with *NEWSROOM*	SCHOLASTIC	AP,IB	CA,GG	- E M S T	29.95
PAGEMAKER Full-function desktop publishing system allows user to fully format individual pages	ALDUS	IB,MC	GG	- - - S T	495.00
PAINTWORKS PLUS Drawing program features animation	MEDIAGENIC	AP	CA,GG	P E M S T	79.95
PATTERNMAKER Experiment with creating color patterns to practice balance, symmetry, color, and design	MINDSCAPE	AP	CA,GG	P E M S T	9.95
PIC-BUILDER Complete the 40 build-by-number pictures or create new pictures	OPTIMUM RES	AP,AT,CO	CA,GG	P E M S T	39.95
PICTURE PERFECT High resolution drawing package	MINDPLAY	AP,IB	CA,GG	P E M S T	49.99
PRINT SHOP Create signs, posters, greeting cards, and banners; many choices of graphics and fonts	BRODERBUND	AP,AT,CO,IB	CA,GG	P E M S T	49.95
PRINT SHOP COMPANION Create graphics for use with *PRINT SHOP*	BRODERBUND	AP	CA,GG	P E M S T	39.95
PRINT SHOP GRAPHICS LIBRARY Files of 120 designs for use with *PRINT SHOP*	BRODERBUND	AP,AT,CO,IB	CA,GG	P E M S T	24.95
PRINT SHOP GRAPHICS LIBRARY 3 Graphics for business, international symbols, mythology, fantasy, and a zoo of animals	BRODERBUND	AP,CO	CA,GG	P E M S T	24.95
STICKYBEAR DRAWING Create freehand pictures, make line and geometric patterns	OPTIMUM RES	AP	CA,GG	P - - - -	39.95

Title	Publisher	Computers	Modes	P E M S T	Price
SUPERPAINT Graphics program combines draw and paint functions	SILICON BEAC	MC	CA,GG	- E M S T	149.00
SUPERPRINT Graphics package features very large posters	SCHOLASTIC	AP	CA,GG	P E - - T	59.95
TAKE 1: ANIMATION GRAPHICS Accepts previously created graphics into a slide show for presentation	BAUDVILLE	AP,CO	CA,GG	- E M S T	59.95
TOP DRAW Graphics development tool for creating structured graphics and drawings in color on the IIGS	STYLEWARE	AP	CA,GG	P E M S T	99.95
TOY SHOP Twenty mechanical models to customize and print	BRODERBUND	AP,CO,IB,MC	CA,GG	- E M S T	49.95
VIDEOWORKS II Draw and animate objects; full editing by frames (includes brief, stylized nude sequence)	BRODERBUND	MC	CA,GG	- E M S T	60.00

BUSINESS EDUCATION - ACCOUNTING/BOOKKEEPING

Title	Publisher	Computers	Modes	P E M S T	Price
AUTOMATED ACCOUNTING Complete package for high school accounting instruction	SW PUB	AP,CO,IB,TR	SI,TU	- - - S -	64.50
INTEGRATED ACCOUNTING General-purpose accounting package with student guide and exercises	BEDFORD SOFT	IB,MC	DE,SI,TU	- - - S -	349.00

BUSINESS EDUCATION - ECONOMICS

Title	Publisher	Computers	Modes	P E M S T	Price
ELECTRONIC MONEY Practice in recognizing specific uses of electronic money transactions in business	MECC	AP,CO,IB	DP,SI,TU	- E M - -	36.00
MARKET PLACE, THE Economic simulations include selling apples, plants, lemonade, and bicycles	MECC	AP,CO,IB,TC	EG, SI	- E M - -	39.00
WHATSIT CORPORATION Use math skills to make group decisions to operate competitive businesses	SUNBURST	AP,CO,TR	DP,EG,PS,SI	- E M S -	59.00

BUSINESS EDUCATION - TYPING

Title	Publisher	Computers	Modes	P E M S T	Price
see also KEYBOARDING section					
ALPHABETIC KEYBOARDING Beginning through intermediate exercises to introduce keyboard; drills and timed drills	SW PUB	AP,IB,TR	DP,TU	- - M S -	89.50
TYPING TUTOR IV Instruction on finger placement; drills for speed and accuracy	SIMON & SCHU	AP,CO,IB	DP	- - M S -	49.95

Title	Publisher	Computers	Modes	P E M S T	Price
ALL SORTS OF MEGGLES	ED TECH	AP	DP,PS	P E - - -	75.00
Practice decision-making skills; testing and record keeping; requires Ufonic system					
APPLE LOGO II	APPLE	AP	CP,PS	P E M S T	150.00
Programming language					
Title	**Publisher**	**Computers**	**Modes**	**P E M S T**	**Price**
BASICS OF BASIC	FOCUS	AP,IB,TA	CP	- - - S -	85.00
Twelve modules in BASIC program writing use hi-res graphics and sound; examples and quizzes					
COMMODORE LOGO	COMMODORE	CO	CP,PS	P E M S T	59.95
Full graphic implementation of Logo, with sprites					
CREATE-A-BASE	MECC	AP	CP,DB,DP	- E M S T	35.00
Designed for middle school; includes planning sheets to provide data base experiences					
DATAQUEST: COMPOSER	MECC	AP	AU,DB,IT	- E M S T	55.00
Tool for creating DATAQUEST programs					
DATAQUEST: SAMPLER	MECC	AP	DB,SI	- E M S -	55.00
Teaches the use of a database					
EZ LOGO	MECC	AP	CP,PS,TU	P E - - -	49.00
Introduces a subset of Logo commands; separate Logo not required					
FOR YOUR NEXT ADVENTURE	SUNBURST	AP	EG,SI	- E M S -	59.00
Adventure game format for practicing FOR-NEXT loops in BASIC					
FRIENDLY COMPUTER, THE	MECC	AP,CO	PS,TU	P - - - -	49.00
Sequence of five graded programs to introduce the computer and keyboard					
FRIENDLY FILER	GROLIER	AP,IB	DB,PS	- E M S -	49.95
Designed-for-education database; includes instructional materials					
GPLE: GLOBAL PROGRAM LINE EDITORBEAGLE BRO		AP	CP	- E M S T	49.95
Full-featured editor for use in writing computer programs					
HOMETOWN: LOCAL AREA STUDY	ACTIVE LEARN	AP,IB,CO	DB,PS,SI	- - M S -	148.00
Students analyze demographic data relating to their own local information					
IBM LOGO	IBM	IB	CP,PS	P E M S T	175.00
Full implementation of LCSI Logo					
KAREL THE ROBOT	WILEY	AP,IB,JR	CP,PS	- - M S -	250.00
Provides an interactive environment for exploring a limited set of Pascal processes					
KRELL LOGO	KRELL	AP	CP,PS	P E M S T	89.95
Version of M.I.T. Logo					
LEARNING THROUGH LOGO	SUNBURST	AP	CP,PS	P E M S -	55.00
Beginning Logo commands and procedures; activity cards; requires Apple Logo					
LOGOWORKS	TERRAPIN	AP,CO	CP,PS	P E M S -	29.95
Logo activities to support the use of Terrapin Logo as a problem-solving tool					
LOGOWRITER	LCSI	AP,IB,JR	CP,GG,WP	P E M S T	450.00
Integrates word processing with a version of the Logo programming language					

Title	Publisher	Computers	Modes	P E M S T	Price
SCHOLASTIC'S PFS: FILE AND REPORT SCHOLASTIC		AP,IB	DB	- - M S T	99.95
Database program with application files for students					
SPECTRUM: PATTERNS AND PROGRAMS SUNBURST		AP	EG,PS	- - M S -	55.00
Logic game using hidden pattern of colored bars; introduces fundamental programming skills					
STUFF AND FETCH	MECC	AP	DB,PS,WP	- E M S -	45.00
Use built-in word processor to put information into the database and retrieve it					
SURVEY TAKER	SCHOLASTIC	AP	DB,SH,SI	- E M S T	29.95
Allows development of 50-question survey to be completed on-line; results may be graphed					
TERRAPIN LOGO	TERRAPIN	AP	CP,PS	P E M S T	99.95
Version of M.I.T. Logo					
TRIVIA MACHINE	MECC	AP	DB,EG,PS,SI	- E M S -	49.00
Trivia game for developing data base thinking skills and keyword searching skills					
TURBO PASCAL	BORLAND	AP,IB	CP,PS	- - M S T	49.95
Inexpensive Pascal implementation; executes very rapidly					
TURBO PASCAL MAC	BORLAND	MC	CP,PS	- - M S T	39.95
Pascal language for the Macintosh					
TURTLE TRACKS	SCHOLASTIC	AP,AT,CO,IB	CA,GG,PS	P E - - -	59.95
Use simple keyboard commands to create shapes and music					
VOYAGE MIMI: INTRO TO COMPUTING	HOLT R&W	AP	EG,PS,SI,TU	- E M - -	122.25
Explores programming and geometric concepts					

ELECTRONIC PERIODICALS

Title	Publisher	Computers	Modes	P E M S T	Price
MICROZINE SUBSCRIPTION	SCHOLASTIC	AP	CA,EG,IT,SI	- E M S -	169.00
Five disks per year; four programs per disk; new Twistaplot and utility on each disk					
NEWSQUEST	TIME	AP,IB	DP,IT	- - M S -	89.95
Weekly disk covering current events; available with TIME magazine subscription					

HEALTH

Title	Publisher	Computers	Modes	P E M S T	Price
ALCOHOL 'THE PARTY'	MARSHWARE	AP	SI,TU	- - M S -	49.95
Reaction time is displayed as program simulates varying quantities of alcohol consumption					
BODY ELECTRIC	HRM SOFTWR	AP,CO,IB,TR	IF	- - - S -	450.00
Use an interface card and electrodes to measure electrical activity from four areas of the body					
HEALTH AWARENESS GAMES	HRM SOFTWR	AP,CO,IB,JR,TR	DE,EG,SI	- - M S -	99.00
Displays risk factors and longevity for a variety of behaviors					
HEART ABNORMALITIES AND EKGs	FOCUS	AP	DE,TU	- - M S -	75.00
Demonstrate normal and abnormal EKG'S and heart abnormalities caused by different conditions					

Title	Publisher	Computers	Modes	P E M S T	Price
LEARNING TO COPE WITH PRESSURE	SUNBURST	AP	DE,IF	P E M S T	99.99
Uses biofeedback galvanic skin responses to help users to reduce stress					
NOW HEAR THIS	MARSHWARE	AP	TU	P E - - -	41.95
Reinforces fundamentals of hearing; covers major parts of the ear, its self-protection abilities, and sign language					
SMOKING DECISION	SUNBURST	AP	SI	- - M S -	65.00
Helps students to make decisions concerning cigarette use					
YOU ARE WHAT YOU EAT	MARSHWARE	AP	DE,SI	- E M S -	39.95
Analyzes nutritional value of a student's selection of food for one day; generates printout					

INSTRUCTIONAL TOOLS - AUTHORING SYSTEM

Title	Publisher	Computers	Modes	P E M S T	Price
ELECTRIC POET	IBM	IB	AU,CA	- E M S T	75.00
Authoring system with color, graphics, animation, and print capabilities; electronic presentation					
HYPERCARD	APPLE	MC	AU,DB,GG	- E M S T	49.00
Multi-media authoring and data base program					

INSTRUCTIONAL TOOLS - CLASSROOM MANAGEMENT

Title	Publisher	Computers	Modes	P E M S T	Price
CSL MARKS	CHANCERY SOF	AP,MC	IM	- - - - T	98.00
Complete teacher grade book program					

INSTRUCTIONAL TOOLS - DATABASE

Title	Publisher	Computers	Modes	P E M S T	Price
APPLEWORKS	CLARIS	AP	DB,SD,WP	- - M S T	175.00
Integrated word processor, spreadsheet, database					
BANK STREET FILER	BRODERBUND	AP,CO	DB	- E M S T	69.95
Database with applications in a variety of subject areas					
BANK STREET SCHOOL FILER	SUNBURST	AP,CO	DB	- E M S T	99.00
Database program with application files for students					
CREATE-A-BASE	MECC	AP	CP,DB,D	- E M - -	35.00
Designed for middle school; includes planning sheets to provide database experiences					
DATAQUEST: COMPOSER	MECC	AP	AU,DB,IT	- - - S T	55.00
Allows creation of additional MECC DATAQUEST diskettes					
DBASE	ASHTON TATE	IB,MC	DB	- - - S T	695.00
Full-function database program					
FILEMAKER	NASHOBA	MC	DB	- - - S T	295.00
Full-function database program					

Title	Publisher	Computers	Modes	P E M S T	Price
FRIENDLY FILER Designed-for-education database; includes instructional materials	GROLIER	AP,IB	DB,PS	- E M S T	59.95
HYPERCARD Multi-media authoring and database program	APPLE	MC	AU,DB,GG	- E M S T	49.00
LOTUS 1-2-3 Integrated spreadsheet, database, and word processor	LOTUS	IB	DB,SD,WP	- - - S T	495.00
MASTERTYPE'S FILER Database program with application files for students	MINDSCAPE	AP,CO,IB	DB	- E M S T	39.95
MICROSOFT WORKS Integrated program includes word processor, database, spreadsheet, and telecommunications	MICROSOFT	IB,MC	DB,SD,TC,WP	- - - S T	295.00
SCHOLASTIC'S PFS: FILE AND REPORT SCHOLASTIC Database program with application files for students		AP,IB	DB	- - M S T	99.95
SURVEY TAKER Allows development of 50-question survey to be completed on-line; results may be graphed	SCHOLASTIC	AP	DB,SH,SI	- E M S T	29.95

INSTRUCTIONAL TOOLS - GRAPHICS GENERATOR

Title	Publisher	Computers	Modes	P E M S T	Price
AWARD MAKER PLUS Create certificates with personalized messages	BAUDVILLE	AP,IB,MC	GG	P E M S T	39.95
BLAZING PADDLES Tool for creating computer art; includes graphics library	BAUDVILLE	AP,CO	CA,GG	- E M S T	55.00
CALENDAR CRAFTER Tool for designing custom calendars that include short notes and small graphics	MECC	AP	CA,GG	- - M S T	59.00
CLIP ART COLLECTION V.1 Collection of graphics for NEWSROOM	SPRINGBOARD	AP,CO,IB	GG,IM	- - M S T	29.95
CLIP ART COLLECTION V.2 Collection of graphics for NEWSROOM	SPRINGBOARD	AP,CO,IB	GG,IM	- - M S T	39.95
COLOR ME: COMPUTER COLORING KIT Draw freehand, or color and cut-and-paste predrawn pictures	MINDSCAPE	AP	CA,GG	P E - - T	29.95
CREATE WITH GARFIELD Create cartoons with Garfield characters; can be printed	DLM	CO	CA,GG	P E M - -	29.95
CRICKET DRAW Full-featured graphics tool with many advanced features	CRICKET SW	MC	CA,GG,IM	- - M S T	295.00
CRICKET GRAPH Full-featured package to produce graphs and charts	CRICKET SW	MC	GG,IM	- - M S T	195.00
DELTA DRAWING Create colored designs by using simple commands	SPINNAKER	AP,AT,CO,IB	CA,CP,PS	P E M - -	49.95
EASY GRAPH Produce pictographs, pie charts, and bar graphs; includes instructional materials	GROLIER	AP,CO,IB,JR	GG,TU	- E M S T	49.95

Title	Publisher	Computers	Modes	P E M S T	Price
FANTAVISION	BRODERBUND	AP	CA,GG	- - M S T	59.95
'Tweening' creates up to 64 animated sequences for each picture drawn by user					
GRAPHICWORKS	MINDSCAPE	MC	GG	- - M - -	149.95
Desktop publishing tool; comes with clip art collection					
HYPERCARD	APPLE	MC	AU,DB,GG	- E M S T	49.00
Multi-media authoring and database program					
KOALAPAINTER	PTI-KOALA	AP,AT,CO,JR	CA,GG	P E M - T	29.95
Graphics used with nursery rhymes; requires Koalapad					
MAC ART DEPARTMENT	SIMON & SCHU	MC	CA,GG	- - - S T	39.95
General-purpose graphics development tool					
MACPAINT	CLARIS	MC	CA,GG	- E M S T	125.00
General-purpose graphics development tool					
MECC GRAPH	MECC	AP	GG	- - M S -	49.00
Generate line, pie, or bar graphs based on student input					
MECC GRAPHING PRIMER	MECC	AP	GG,PS,TU	- E M - T	45.00
Teaches analysis of bar, line, and pie graphs					
MOUSE PAINT	CLARIS	AP	CA,GG	P E M - T	100.00
Graphics generation program; includes mouse					
PAINTWORKS PLUS	MEDIAGENIC	AP	CA,GG	P E M S T	79.95
Color graphics program with animation capabilities					
PFS: GRAPH	SCHOLASTIC	AP,IB	GG	- - M S T	134.95
Generate pie, bar, and line charts from user-entered data or from PFS: FILE data					
PRINCIPAL'S ASSISTANT	MINDSCAPE	AP	GG	- - M S T	59.95
Generates awards, blackline masters, certificates, signs, and posters					
PRINT MAGIC	EPYX	AP,IB	GG	P E M S T	59.95
Create greeting cards, flyers, banners, and certificates; customize using the drawing package					
PRINT SHOP	BRODERBUND	AP,AT,CO,IB	CA,GG	P E M S T	49.95
Create signs, posters, greeting cards, and banners; many choices of graphics and fonts					
PRINT SHOP GRAPHICS IIGS LIBRARYBRODERBUND		AP	CA,GG	P E M S T	34.95
Graphics for business, international symobols, mythology, fantasy, and a zoo of animals					
PROFESSIONAL SIGN MAKER	SUNBURST	AP	GG,IM	- - - S T	65.00
Produce letters for signs, overhead transparences, etc.					
READY, SET, GO	LETRASET USA	MC	GG,IM	- - - S T	495.00
Full-featured page layout and desktop publishing tool					
SUPERPAINT	SILICON BEAC	MC	CA,GG	- E M S T	149.95
Full-featured graphics program that combines draw and paint functions					
SUPERPRINT	SCHOLASTIC	AP	CA,GG	- - M S T	59.95
Generate posters up to five feet long from available graphics packs					
TAKE 1: ANIMATION GRAPHICS	BAUDVILLE	AP,CO	CA,GG	- E M S T	59.95
Accepts previously created graphics into a slide show for presentation					

Title	Publisher	Computers	Modes	P E M S T	Price
TOP DRAW	STYLEWARE	AP	CA,GG	- - M S T	99.95
Development tool to create structured graphics and drawings in color on the IIGS					
TURTLE TRACKS	SCHOLASTIC	AP,AT,CO,IB	CA,GG,PS	P E - - -	59.95
Use simple keyboard commands to create shapes and music					
VIDEOWORKS II	BRODERBUND	MC	CA,GG	- E M S T	60.00
Draw and animate objects; full editing by frames (includes brief, stylized nude sequence)					
WALT DISNEY COMIC STRIP MAKER	SUNBURST	AP	CA,GG	- E M S -	75.00
Graphics generating program allows students to create comics using Disney characters					

INSTRUCTIONAL TOOLS - INSTRUCTIONAL MATERIALS GENERATOR

Title	Publisher	Computers	Modes	P E M S T	Price
ARBPLOT	CONDUIT	AP	DE,TU	- - - S -	125.00
Demo of curve plotting, limits and derivatives, integration, sequences, series, and finding of roots					
BANK STREET MUSICWRITER	MINDSCAPE	AT,CO,IB	CA,IM	P E M S -	49.95
Create music and print the score					
CERTIFICATE MAKER	SPRINGBOARD	AP,AT,CO,IB,MC	GG,IM	P E M S T	39.95
Design and print professional-looking certificates					
CLIP ART COLLECTION V.1	SPRINGBOARD	AP,CO,IB	GG,IM	- E M S T	29.95
Collection of graphics for NEWSROOM					
CLIP ART COLLECTION V.2	SPRINGBOARD	AP,CO,IB	GG,IM	- E M S T	39.95
Collection of graphics for NEWSROOM					
CRICKET DRAW	CRICKET SW	MC	CA,GG,IM	- - M S T	295.00
Full-featured graphics tool with many advanced features					
CRICKET GRAPH	CRICKET SW	MC	GG,IM	- - M S T	195.00
Full-featured package to produce graphs and charts					
CROSSWORD MAGIC	MINDSCAPE	AP,AT,CO,IB	DP,EG,IM,SH	- E M S T	49.95
Generate crossword puzzles from user's words; play on-screen or print puzzles					
NEWSROOM	SPRINGBOARD	AP,CO,IBCA,GG,IM,WP		- E M S T	59.95
Desktop publishing program for production of flyers and newsletters					
NEWSROOM PRO	SPRINGBOARD	IB	IM	- - M S T	129.95
Desktop publishing program for production of flyers and newsletters					
PAGEMAKER	ALDUS	IB,MC	GG,IM	- - M S T	495.00
Full-function desktop publishing system allows user to fully format individual pages					
PC STORYBOARD	IBM	IB	GG,IM	- E M S T	350.00
Graphics presentation program with animation and special effects					
POWER POINT	MICROSOFT	MC	GG,IM	- - - S T	395.00
Graphics program for designing presentation screens or overhead transparencies					
PROFESSIONAL SIGN MAKER	SUNBURST	AP	GG,IM	- - - S T	65.00
Produce letters for signs, overhead transparences, etc.					

Title	Publisher	Computers	Modes	P E M S T	Price
PUZZLE MASTER Create jigsaw puzzles from clip art or create your own pictures	SHENANDOAH	TR	EG,GG,IM,SH	- E M - T	89.00
PUZZLES AND POSTERS Design and print word searches, crossword puzzles, mazes, and posters	MECC	AP,CO,IB,TR	EG,GG,IM,SH	P E M S T	59.00
QUICKFLASH Prepare on-line flashcards for any subject	MECC	AP	IM	P E M S T	55.00
TIMELINER Produces printed chronology of historical events, students' lives, etc.	TOM SNYDER	AP	IM	- E M S T	59.95

INSTRUCTIONAL TOOLS - SPELLING CHECKER

Title	Publisher	Computers	Modes	P E M S T	Price
MECC SPELLER Spelling checker for MECC WRITER	MECC	AP	SK	- E M S T	45.00

INSTRUCTIONAL TOOLS - SPREADSHEET

Title	Publisher	Computers	Modes	P E M S T	Price
APPLEWORKS Integrated word processor, spreadsheet, database	CLARIS	AP	DB,SD,WP	- - M S T	175.00
EDUCALC Designed-for-education spreadsheet; includes tutorial and instructional materials	GROLIER	AP,CO,IB,JR	PS,SD,TU	- E M S -	59.95
EXCEL Full-function spreadsheet with graphics	MICROSOFT	MC	SD	- - - - T	395.00
LOTUS 1-2-3 Integrated spreadsheet, database, and word processor	LOTUS	IB	DB,SD,WP	- - - S T	495.00
MICROSOFT WORKS Integrated program includes word processor, database, spreadsheet, and telecommunications	MICROSOFT	IB,MC	DB,SD,TC,WP	- - - S T	295.00

INSTRUCTIONAL TOOLS - STUDENT STUDY AID

Title	Publisher	Computers	Modes	P E M S T	Price
A-PLUS: THE HOMEWORK SOLUTION Integrated scheduler, database, and word processor as an individual study tool	*SAVTEK CORP*	IB	DB,IM,WP	- - M S -	85.95
HOMEWORKER Integrated textwriter, outliner, flash-card-maker, calculator, calendar, and gradekeeper	DAVIDSON	AP,IB	DB,IM,WP	- - M S -	89.95

INSTRUCTIONAL TOOLS - TELECOMMUNICATIONS

Title	Publisher	Computers	Modes	P E M S T	Price
ELECTRONIC MAILBAG Simulated electronic mail system; includes instructional materials	EXSYM	AP	SI,TC	- E M S -	49.95
ELECTRONIC VILLAGE Introduces telecommunications concepts and provides practice before going on-line	EXSYM	AP	SI,TC,TU	- E M S -	75.95
INFORMATION CONNECTION Demonstrates use of on-line databases; includes communications software	GROLIER	AP,CO,IB	DB,SI,TC,TU	- E M S T	69.95
MACTERMINAL Full-function communications program	CLARIS	MC	TC	- - - S T	40.00
MICROSOFT WORKS Integrated program includes word processor, database, spreadsheet, and telecommunications	MICROSOFT	IB,MC	DB,SD,TC,WP	- - - S T	295.00
RED RYDER Full-function communications package	FREESOFT	MC	TC	- - - S T	40.00
SMARTCOM II Full-function communications package	HAYES	AP,IB,MC	TC	- - M S T	149.00

INSTRUCTIONAL TOOLS - WORD PROCESSOR

Title	Publisher	Computers	Modes	P E M S T	Price
APPLEWORKS Integrated word processor, spreadsheet, database	CLARIS	AP	DB,SD,WP	- - M S T	175.00
BANK STREET STORYBOOK Users write, illustrate, and print a story or short book	MINDSCAPE	AP,CO,IB	CA,WP	- E M - -	39.95
BANK STREET WRITER III New version of BSW with thesaurus and spell checker; includes instructional materials	SCHOLASTIC	AP,IB	SK,WP	- E M S T	79.95
BANK STREET WRITER PLUS New version of BSW with thesaurus and spell checker; includes instructional support materials	BRODERBUND	AP,IB	SK,WP	- E M S T	79.95
CALLIOPE Idea processor with word processing capabilities	INNOVISION	AP,MC	IT,PS,WP	- - M S T	59.95
FIRST CHOICE Integrated word processor, spreadsheet, database package	MEIZNER	IB	WP	- - - S T	131.12
FIRST DRAFT Planning, outlining, and writing tool; can be used with ProDOS-based word processors	SCHOLASTIC	AP	CA,WP	- - M S T	69.95
FREDWRITER Designed-for-education word processor with prompted writing capabilities	SOFTSWAP	AP	CA,WP	- E M S T	40.00
GHOST WRITER Writing analysis tool to encourage students to improve their composition skills	MECC	AP	SK,TU,WP	- - M S -	90.00
II WRITE Full-function word processor with Mac-like features	RANDOM	AP	WP	- - M S T	89.95

Title	Publisher	Computers	Modes	P E M S T	Price
LOTUS 1-2-3 Integrated spreadsheet, database, and word processor	LOTUS	IB	DB,SD,WP	- - - S T	495.00
MAC PROOF Writing analysis tool for style and usage aspects of writing	A.L.P.S.	MC	WP	- - M S T	195.00
MACWRITE Full-function word processor	CLARIS	MC	WP	- E M S T	125.00
MAGIC SLATE Designed-for-education word processor with 20, 40, or 80 columns; inc. instructional materials	SUNBURST	AP	WP	P E M S T	89.95
MECC WRITER Designed-for-education word processor; includes instructional materials	MECC	AP	WP	- E M S T	49.00
MICROSOFT WORD Full-function word processor	MICROSOFT	IB,MC	WP	- - - S T	395.00
MICROSOFT WORKS Integrated program includes word processor, database, spreadsheet, and telecommunications	MICROSOFT	IB,MC	DB,SD,TC,WP	- - - S T	295.00
MILLIKEN WORD PROCESSOR Designed-for-education word processor; inc. instructional materials (THE WRITING WORKSHOP)	MILLIKEN	AP	WP	P E M S T	69.95
MORE Outlining program capable of displaying a tree structure	LIV TEXT	MC	WP	- - - S T	299.00
MULTISCRIBE Full-function word processor with Mac-like features	SCHOLASTIC	AP	WP	- E M S T	99.95
MULTISCRIBE GS Full-function word processor with Mac-like features	SCHOLASTIC	AP	WP	- E M S T	99.95
PFS: WRITE Full-function word processor; includes instructional materials	SCHOLASTIC	AP,IB	WP	- - M S T	99.95
SENSIBLE GRAMMAR Writing analysis package	SENSIBLE	AP	TU,WP	- - M S T	99.95
WORD PERFECT Full-function word processor	WORD PERFECT	AP,IB,MC	WP	- E M S T	495.00
WRITING WORKSHOP, THE Complete program with support materials; prewriting, word processor, and post-writing	MILLIKEN	AP	TU,WP	- E M S T	450.00

KEYBOARDING

Title	Publisher	Computers	Modes	P E M S T	Price
see also BUSINESS EDUCATION - TYPING section					
ALPHABETIC KEYBOARDING Beginning through intermediate exercises to introduce keyboard; drills and timed drills	SW PUB	AP,IB,TR	DP,TU	- - M S -	89.50
KEYBOARD CADET Introduces proper fingering for touch typing on Dvorak or QWERTY keyboard	MINDSCAPE	AP	DP,TU	P E - - -	39.95

Title	Publisher	Computers	Modes	P E M S T	Price
KEYBOARDING MASTER Drills to emphasize development of speed and accuracy	MECC	AP	DP	- E M S -	55.00
KEYBOARDING PRIMER Eighteen lessons to introduce the keyboard and help with correct fingering techniques	MECC	AP	DP,TU	- E M S -	55.00
MASTERTYPE Multiple levels of keyboarding practice for individualized skill development; editing option	MINDSCAPE	AT,CO,IB	DP,EG,TU	- E M S -	39.95
MICROTYPE: WONDERFUL WORLD OF PAWSSW PUB Graphic instruction and practice in touch typing		AP,CO	DP,TU	- E M - -	39.95
STICKYBEAR TYPING Instruction and practice in keyboarding skills; stores student progress on disk	OPTIMUM RES	AP	DP,TU	P E - - -	39.95
SUCCESS WITH TYPING Complete touch typing and keyboarding instruction in twenty lessons	SCHOLASTIC	AP	DP,TU	- E M S -	69.95
TYPE TO LEARN Language-based approach to keyboarding; practice in spelling and composition	SUNBURST	AP	DP,TU	- E M - -	69.95
TYPE! Features performance graphs, customized exercises, and game	BRODERBUND	AP,CO,IB	DP,TU	- - M S -	44.95
TYPING TUTOR IV Instruction on finger placement; drills for speed and accuracy	SIMON & SCHU	AP,CO,IB,MC	DP,TU	- - M S -	49.95

LANGUAGE ARTS

Title	Publisher	Computers	Modes	P E M S T	Price
see also INSTRUCTIONAL TOOLS - INSTRUCTIONAL MATERIALS GENERATOR section see also INSTRUCTIONAL TOOLS - SPELLING CHECKER section see also INSTRUCTIONAL TOOLS - WORD PROCESSOR section					
ACE REPORTER Students gather information and make notes	MINDPLAY	AP	EG,SI	P E - - -	49.99
ADVENTURE CONSTRUCTION SET Users write and illustrate their own adventure games	ELECTR ART	AP,CO,IB	CA	- E M S -	49.95
ALICE IN WONDERLAND A series of adventures to stimulate and develop problem-solving and writing skills	HRM SOFTWR	AP	CA,EG	P E - - -	39.95
AUTHOR! AUTHOR! A playwriting, drama, and creative writing program	MINDPLAY	AP	CA	P E M S -	59.99
BANK STREET WRITER III New version of BSW with thesaurus and spell checker; includes instructional materials	SCHOLASTIC	AP,IB	SK,WP	- E M S T	79.95
BE A WRITER! Lessons to use with MAGIC SLATE II; descriptive, narrative, and explanatory writing	SUNBURST	AP	CA	P - - - -	59.00
CHARIOTS, COUGARS, AND KINGS Practice with comprehension skills, detail, and sequence; record keeping; editing option	HARTLEY	AP	DP,SH,TE	P E - - -	39.95
COMPARISON KITCHEN Six games reinforce pre-reading and math skills of visual perception and discrimination	DLM	AP	DP,EG	P - - - -	29.95

Title	Publisher	Computers	Modes	P E M S T	Price
COMPUTER CROSSROADS	ED'L ACTV	AP	DP,PS	- E - - -	99.95
Create adventures, make decisions, and practice reading comprehension skills					
CREATE WITH GARFIELD	DLM	CO	CA,GG	- E M - -	29.95
Create cartoons with Garfield characters; can be printed					
CROSSWORD MAGIC	MINDSCAPE	AP,AT,CO,IB	DP,EG,IM,SH	- E M S T	49.95
Generate crossword puzzles from user's words; play on-screen or print puzzles					
ELECTRIC WRITING	CREATIVE PUB	AP	CA,WP	- E M - -	26.95
A variety of writing activities for use with BSW, APPLEWORKS, and other word processors					
ENGLISH ACHIEVEMENT I-V	MINDSCAPE	AP,CO,IB,JR,PE	DP,TU	- - - S -	199.75*
Practice preparing for portions of the CEEB English composition achievement test					
EXPLORE-A-STORY SERIES	DC HEATH	AP	PS,TU	P E - - -	720.00*
Read and rearrange stories or create new stories; includes graphics					
FAY'S WORD RALLY	DIDATECH	AP,CO	BG	P - - - -	49.95
Reinforces sight words, sentence comprehension, vocabulary, and reasoning skills; management					
FIRST DRAFT	SCHOLASTIC	AP	CA,WP	P E M S -	69.95
Planning, outlining, and writing tool; can be used with ProDOS-based word processors					
FIRST-LETTER FUN	MECC	AP	DP,EG	P - - - -	55.00
Practice letters with beginning sounds of words corresponding to pictures in the story					
FREDWRITER	SOFTSWAP	AP	CA,WP	- E M S T	40.00
A word processor with a tutorial and prompted writing activities					
FUN FROM A TO Z	MECC	AP	CA,EG	P - - - -	55.00
Letter discrimination, match uppercase and lowercase letters, and create pictures					
GETTING READY TO READ AND ADD	SUNBURST	AP,AT,CO,IB,JR	DP,EG	P - - - -	59.00
Drill in letter, number, and shape recognition					
GHOST WRITER	MECC	AP	SK,TU,WP	- - - S T	90.00
Writing analysis tool to encourage students to improve their composition skills					
GRAMMAR GREMLINS	DAVIDSON	AP,IB	DP,EG	- E M S -	49.95
Comprehesive grammar program with rules and a variety of reinforcing activities; editing option					
HINKY PINKY GAME	MINDSCAPE	AP	BG	P E M S -	39.95
Guess rhyming words from hints and definitions; three levels; editing option					
I CAN WRITE!	SUNBURST	AP	CA,WP	P - - - -	59.00
Twenty-five lessons for use with 20-column MAGIC SLATE					
JACK AND THE BEANSTALK	HRM SOFTWR	AP	EG,PS	P E M - -	39.95
Animated adventure game challenges problem-solving and reading skills					
LETTERS AND FIRST WORDS	C & C SOFT	AP	DP,EG	P - - - -	50.00
Letter recognition skills and short words; reinforce basic language skills					
LISTEN TO LEARN	IBM	IB	WP	- E M - -	156.00
Full-function word processor with speech capability; includes instructional support materials					
LOGOWRITER	LCSI	AP,IB,JR	CP,GG,WP	P E M S T	450.00
Integrates word processing with a version of the Logo programming language					

Title	Publisher	Computers	Modes	P E M S T	Price
M-SS-NG L-NKS: CLASSICS	SUNBURST	AP,AT,CO,IB,TR	EG,PS	- - M S T	59.00
Reading activities to develop use of context clues; based on classic literature					
M-SS-NG L-NKS: ENGLISH EDITOR	SUNBURST	AP,AT,IB,JR,TR	EG,PS,SH	P E M S T	69.00
Reading activities to develop use of context clues; editing option					
M-SS-NG L-NKS: MICRO ENCYCLOPEDIA	SUNBURST	AP,CO,IB,JR,TA	DP,EG,PS	- E M - -	65.00
Reading activities to develop use of context clues; themes of 'Ice Cream' or 'Whales and Sharks'					
M-SS-NG L-NKS: YOUNG PEOPLE'S LIT	SUNBURST	AP,AT,CO,IB,TR	EG,PS	- E M S T	59.00
Reading activities to develop use of context clues; based on familiar stories for young adults					
MAGIC SLATE	SUNBURST	AP	WP	P E M S T	89.95
Designed-for-education word processor with 20, 40, or 80 columns; inc. instructional materials					
MASTER SPELL	MECC	AP	DP,SH,TU	P E M S T	59.00
Design word lists and lessons to fit individual needs; records misspelled words for review					
MECC WRITE START	MECC	AP	DP,TU,WP	- - M S -	29.00
Activities using MECC WRITER to share ideas, experiment with words, and write stories or poems					
MUPPET WORD BOOK, THE	SUNBURST	AP	DP	P - - - -	65.00
Muppet characters introduce letters, words, and simple writing skills					
MUPPETVILLE	SUNBURST	AP	DP	P - - - -	65.00
Kermit explores colors, shapes, numbers, and patterns in Muppetville					
NEWBERY ADVENTURE: CHARLOTTE'S WEB	SUNBURST	AP	DP,EG	P E - - -	65.00
Development of comprehension skills of main ideas, details, sequencing, and vocabulary					
NEWBERY ADVENTURE: WRINKLE IN TIME	SUNBURST	AP	DP,EG	- E - - -	65.00
Development of comprehension skills of main ideas, details, sequencing, and vocabulary					
PAINT WITH WORDS	MECC	AP	CA,EG	P - - - -	55.00
Develop vocabulary and create pictures; Ufonic voice system optional; can be printed					
PERPLEXING PUZZLES	HARTLEY	AP	EG,PS,SH	- E M S -	39.95
Use critical reading skills to solve problems; editing option					
PHONICS PRIME TIME: BLENDS AND DIGRA.	MECC	AP	DP	P - - - -	49.00
Practice with identification of 34 consonant blends and digraphs					
PHONICS PRIME TIME: FINAL CONSONAN.	MECC	AP	DP	P - - - -	55.00
Practice with letter identification of everyday words					
PHONICS PRIME TIME: INITIAL CONSONAN.	MECC	AP	DP	P - - - -	55.00
Practice with letter and word identification					
PHONICS PRIME TIME: VOWELS I	MECC	AP	DP	P - - - -	49.00
Practice with identification of twelve long and short vowel sounds in simple words					
PHONICS PRIME TIME: VOWELS II	MECC	AP	DP	P - - - -	49.00
Practice with identification of "r-controlled," "rule-breakers," and common diphthongs					
PLAYWRITER'S THEATER	ED TECH	AP	EG,PS,SI,WP	- E M - -	98.00
Select characters, actions, scenes, and phrases to create plays; requires Ufonic voice system					

Title	Publisher	Computers	Modes	P E M S T	Price
PLAYWRITER: SERIES	GROLIER	AP,CO,IB	CA	P E M - -	39.95
Use writing and graphics activities to create books					
POETRY EXPRESS	MINDSCAPE	AP	CA,TU	P E M - -	49.95
Line-by-line guidance encourages students to write and print poetry; includes samples					
PUZZLER	SUNBURST	AP,CO,IB,JR,TC	DP,EG,PS	- E M - -	59.00
Use reading strategies of predicting and confirming; create individual or group compositions					
READER RABBIT	TLC	AP,CO,IB,JR	DP,EG	P - - - -	39.95
Four games with graphics to practice letter and word recognition					
READING FOR INFORMATION LV. II-IV	IBM	IB,JR	DP,TU	P E M - -	340.00*
Read charts to answer questions; reading arguments					
READING FOR MEANING LV. I-IV	IBM	IB	PS,TU	- E M - -	480.00*
A variety of reading comprehension activities					
READING WORKSHOP, THE	MINDSCAPE	AP	DP	- E M - -	425.00
Activities and problems to introduce short stories					
SHOW TIME	MECC	AP	CA	- - M S -	55.00
Make corrections in script and theater directions to create plays					
SOCMATE	AGS	AP	EG,PS	P E M S -	44.95
A series of games to teach synonyms, antonyms, and homonyms					
SOUND IDEAS SERIES	HOUGHTON	AP	DP,TU	P - - - -	348.00*
Teaches short and long vowels, consonants, and word attack skills					
STICKYBEAR ABC	OPTIMUM RES	AP,CO	DP,EG	P - - - -	39.95
Three games present word identification, order, and matching					
STUDENT STORIES	MECC	AP	CA	P - - - -	45.00
Eighteen stories use students' names to develop reading skills					
SUPER SCOOP II	COMPRESS	AP	SI	- - - S -	65.00
Pre-writing activities help students investigate and write a news story					
TALKING TEXT WRITER	SCHOLASTIC	AP,IB,JR	WP	P E M - -	199.95
Full-function word processor with speech capability; includes instructional support materials					
THOSE AMAZING READING MACHINES I-V	MECC	AP	CA,EG,PS	P E - - -	275.00*
Reading comprehension skills of sequencing and detail are developed with "wacky machines"					
WALLY'S WORD WORKS	SUNBURST	AP,CO	CA,EG	- E M S T	75.00
Parts of speech are presented within the context of sentences and paragraphs					
WALT DISNEY COMIC STRIP MAKER	SUNBURST	AP,CO	CA,EG	- E M S T	75.00
Writing skills are developed through comic strips					
WINNIE THE POOH IN 100 ACRE WOOD	SUNBURST	AP,CO	EG,PS	P E - - -	49.95
Read directions and maps to find objects in the woods; practice recall and inference					
WORD HERD: LOOK LIKES	MECC	AP	DP	- - M S -	45.00
Twelve sets of similar-looking words are mastered through practice in spelling, meaning, and use					
WORD HERD: SOUND ALIKES	MECC	AP	DP	- - M S -	45.00
Twelve sets of homophones are mastered through definition and usage in sentences					

Title	Publisher	Computers	Modes	P E M S T	Price
WORD MUNCHERS Practice skills of recognizing vowels, dipthongs, and digraphs	MECC	AP	DP,EG	P E - - -	55.00
WORD WIZARDS Four graphic spelling and vocabulary activities; editing option	MECC	AP	DP,SH	P E M - -	59.00
WORD-A-MATION Develop vocabulary skills by transforming words from the beginning and ending of a word chain	SUNBURST	AP	DP,EG,PS	- E M S -	65.00
WORDS AT WORK: CONTRACTION ACTION Practice in identification, spelling, and meaning of more than 50 contractions	MECC	AP	DP	P E - - -	49.00
WRITE ON! SERIES Data disks with writing activities to be used with standard word processors	HUMANITIES	AP	PS,TU,WP	P E - - -	1955.00*
WRITER RABBIT Tool for writing skills and reading comprehension	TLC	AP,IB	CA,DP,EG	P E - - -	54.95
WRITER'S HELPER II Guides students in creating and organizing ideas, writing, and evaluating their writing	CONDUIT	AP,IB,JR,MC,PS	TU,WP	- - - S -	120.00
WRITING A CHARACTER SKETCH Introduces fiction and non-fiction character development by use of examples and questions	MECC	AP	DP,SH,TU	- - - S -	49.00
WRITING A NARRATIVE Uses brainstorming, listing, and idea-organizing to develop narrative framework and point of view	MECC	AP	DP,TU	- - M S -	49.00
WRITING AN OPINION PAPER Distinguishing between fact and opinion, and the evidence needed to support an opinion	MECC	AP	TU	- - - S -	55.00
WRITING WORKSHOP, THE Complete program with instructional materials: prewriting, word processor, and post-writing	MILLIKEN	AP	TU,WP	- E M S T	450.00*

LIBRARY MEDIA SKILLS

Title	Publisher	Computers	Modes	P E M S T	Price
BOOK WORM Develop a database to produce book reports	MECC	AP	DB	- E M S -	35.00
HOW CAN I FIND IT? Uses a series of branching operations to explore library resources; book titles can be edited	SUNBURST	AP	DB,TU	- E M - -	59.00
INFORMATION CONNECTION Demonstrates use of on-line data bases; includes communications software	GROLIER	AP,CO,IB	DB,TC,TU	- E M S T	69.95
TRIVIA MACHINE Uses a database game to demonstrate searching concepts and strategies	MECC	AP	DB,EG,PS,SI	- E M S -	49.00
WHERE IN WORLD IS CARMEN SANDIEGO? Use THE WORLD ALMANAC to search the world and capture the criminal	BRODERBUND	AP	EG,PS,SI	- E M S -	49.95

MATHEMATICS - ADVANCED MATHEMATICS

Title	Publisher	Computers	Modes	P E M S T	Price
ALGEBRA GRAF(X)	ACTIVE LEARN	IB	DE,GG	- - M S T	118.00
Function grapher; graphs up to 6 sets of axes at once					
CALCULUS	BRODERBUND	MC	SI,TU	- - - S -	109.95
Introductory calculus course					
EXPRESSIONIST	ALLEN BONADI	MC	IM	- - - S T	79.00
Mathematical expression designer					
GRAPHICAL ANALYSIS III	VERNIER	AP	GG,IF,PS	- - - S T	24.95
Plots graphs with experimental data					
MATHTYPE	DESIGN SCI	MC	IM	- - - S T	134.10
Mathematical expression designer					
MICROSOFT MU-MATH	MICROSOFT	AP,IB,TR	PS	- - - S -	250.00
Performs algebra, trig, calculus (differentiation and integration), and transcendental functions					
SEMCALC	SUNBURST	AP,AT,TR	DP,PS,TU	- - M S -	95.00
Tool to develop strategies for interpreting word problems in mathematics					
SUPERPLOT	EDUSOFT	AP	DE,GG	- - M S T	49.95
Graphs any polynomial, trigonometric, logarithmic, or exponential function					
TECMATH--DIFFERENTIATION	TECH ED	AP	GG,TU	- - - S -	60.00
Maximum/minimum problems and related rate problems; includes graphing utility					
TECMATH--INTEGRATION	TECH ED	AP	GG,TU	- - - S -	60.00
Theory of volume of revolution problems; demostrates solutions; includes graphing utility					
TRIGONOMETRY OF THE RIGHT TRIANGLE	MINDSCAPE	AP	DP	- - - S -	39.95
Demonstrates step-by-step solving of trignonometric word proglems					

MATHEMATICS - ALGEBRA

Title	Publisher	Computers	Modes	P E M S T	Price
ALGE-BLASTER!	DAVIDSON	AP,CO,IB	DP,TE,TU	- - M S -	44.95
Contains 670+ problems to supplement an introductory algebra course; editing option					
ALGEBRA GRAF(X)	ACTIVE LEARN	IB	DE,GG	- - M S T	118.00
Function grapher; graphs up to 6 sets of axes at once					
ALGEBRA SHOP, THE	SCHOLASTIC	AP	PS,SI	- - M S -	69.95
Practice pre-algebra concepts while shopping in ten different stores					
ALGEBRAIC PROPOSER	TRUE BASIC	IB	CA,DE,GG,SI	- - M S -	39.95
Experiment with and hypothesize about algebraic concepts					
CACTUSPLOT: A MATHEMATICS UTILITY	CACTUSPLOT	AP,IB,PS	DE,GG	- - M S -	60.00
Graphing utility for plotting functions in standard or parametric form					

Title	Publisher	Computers	Modes	P E M S T	Price
EDUCALC Designed-for-education spreadsheet; includes tutorial and instructional materials	GROLIER	AP,CO,IB,JR	PS,SD,TU	- E M S -	59.95
EDUCALC TEMPLATES Spreadsheet files for use with EDUCALC	GROLIER	AP,CO,IB,JR	PS,SD	- E M S -	19.95
EQUATIONS I Practice solving equations of the form ax + b = c	MINDSCAPE	AP,AT,CO,IB,PE	DP,TU	- - M S -	34.95
EQUATIONS II Practice solving equations of the form ax + b = cx + d	MINDSCAPE	AP,CO,IB,TR	DP,TU	- - - S -	34.95
EXPLORING TABLES AND GRAPHS I Introduce the use of graphs; includes tool to construct graphs for a given set of data	OPTIMUM RES	AP	EG,GG,TU	- E M S -	34.95
EXPLORING TABLES AND GRAPHS II Real-life applications of tables and graphs; picture, bar, line, and area graphs	OPTIMUM RES	AP	EG,GG,TU	- E M S -	34.95
EXPRESSION WRITER Create numeric expressions to achieve arithmetic or algebraic goals	HRM SOFTWR	AP,IB	EG	- E M S -	49.95
EXPRESSIONIST Mathematical expression designer	ALLEN BONADI	MC	IM	- - - S T	79.00
FACTORING ALGEBRAIC EXPRESSIONS Instruction and practice in factoring linear and quadratic expressions	MINDSCAPE	AP,CO,IB,TR	DP,TU	- - - S -	34.95
GRAPHING EQUATIONS Practice in graphing linear and quadratic equations; game format	CONDUIT	AP	DE,EG,PS	- - M S T	60.00
GREEN GLOBS & GRAPHING EQUATIONS Practice in graphing linear and quadratic equations; game format	SUNBURST	AP,IB	DE,EG,GG,PS	- - M S T	65.00
INTERPRETING GRAPHS Practice in making meaningful intrepretations of graphs of physical phenomena	SUNBURST	AP,IB	DE,DP,EG	- E M S -	65.00
KING'S RULE, THE Form and test hypotheses, recognize patterns, and develop problem-solving skills	SUNBURST	AP,CO,IB,TC,TR	EG,PS	- E M S -	59.00
MATH SEQUENCES, REVISED Number readiness and four arithmetic operations with integers, fractions, and decimals	MILLIKEN	AP,AT,PE,TR	DP	P E M - -	495.00*
MATHGRAPHER Demonstrates properties of functions and graphing concepts	HRM SOFTWR	AP,CO	DE,TU	- E M S -	49.95
MICROSOFT MU-MATH Performs algebra, trig, calculus (differentiation and integration), and transcendental functions	MICROSOFT	AP,IB,TR	PS	- - - S -	250.00
QUATIONS Math game, based on SCRABBLE, where students build equations rather than words	SCHOLASTIC	AP	DP,EG,PS	- - M S -	39.95
ROYAL RULES Form/test hypotheses, recognize patterns, develop problem-solving skills, and design challenges	SUNBURST	AP,IB	EG,PS,SH,SI	- E M S -	75.00
SEMCALC Tool to develop strategies for interpreting word problems in mathematics	SUNBURST	AP,AT,TR	DP,PS,TU	- - M S -	95.00
SUPERPLOT Graphs any polynomial, trigonometric, logarithmic, or exponential function	EDUSOFT	AP	DE,GG	- - M S T	49.95

Title	Publisher	Computers	Modes	P E M S T	Price
TOBBS LEARNS ALGEBRA	SUNBURST	AP	DP,SI	- - M S -	59.00
Practice problem solving in number relationships using a 2-by-2 grid					

MATHEMATICS - GEOMETRY/MEASUREMENT

Title	Publisher	Computers	Modes	P E M S T	Price
see also INSTRUCTIONAL TOOLS - INSTRUCTIONAL MATERIALS GENERATOR section					
BAKE AND TASTE	MINDPLAY	AP,IB,JR	SI	P E - - -	39.99
Simulate the creation of baked goods and evaluate their quality					
BUILDING PERSPECTIVE	SUNBURST	AP,CO,IB,JR	EG,PS,SI	- E M - -	65.00
Presents an array of buildings of various heights viewed from five different directions					
BUMBLE GAMES	TLC	AP,AT,CO,IB,TC	DP,EG,PS	P E - - -	54.95
Five programs introduce number pairs to describe positions in an array and on a grid					
BUMBLE PLOT	TLC	AP,CO,IB,TC	DP,EG,PS	- E M - -	39.95
Practice plotting and graphing skills on a coordinate grid (+10 to -10)					
CLOCK	HARTLEY	AP,IB	DP	P - - - -	39.95
Practice telling time and converting digital time to analog time					
CLOCK WORKS	MECC	AP	DP	P E - - -	55.00
Practice telling time using both analog and digital clocks					
CREATIVITY UNLIMITED	SUNBURST	AP	CA	- - M S -	65.00
Develop flexible and original approaches; build, rotate, and expand objects					
CUBE BUILDER	HRM SOFTWR	AP	DP,EG,PS	- E M S -	49.95
Visualize 3-D shapes; discover length, area, and volume relationships through scale changes					
ENCHANTED FOREST, THE	SUNBURST	AP,IB	EG,SI,TU	- E M - -	59.00
Explore the concepts AND, OR, NOT; identify attributes of shape, color, and size					
EXPLORER METROS	SUNBURST	AP	DP,EG	- E M S -	59.00
Practice estimating metric measurements					
FACTORY, THE	SUNBURST	AP,AT,CO,IB,TC	EG,PS,SI	- E M S -	55.00
Practice visual discrimination, spatial perception, sequencing, and ordering skills					
FISH SCALES	DLM	AP	DP,EG	P - - - -	29.95
Six games with music and graphics to practice measurement skills					
GEOMETRIC PRESUPPOSER	SUNBURST	AP	CA,DE,GG,SI	- E M S T	99.00
Experiment with and hypothesize about geometric concepts					
GEOMETRIC SUPPOSER: CIRCLES	SUNBURST	AP	CA,DE,GG,SI	- - M S T	99.00
Investigate properties of circles by making constructions and changing scales					
GEOMETRIC SUPPOSER: QUADRILATERALS	SUNBURST	AP	CA,DE,GG,SI	- - M S T	99.00
Experiment with and hypothesize about quadrilaterals					
GEOMETRIC SUPPOSER: TRIANGLES	SUNBURST	AP	CA,DE,GG,SI	- - M S T	99.00
Experiment with and hypothesize about triangles					

Title	Publisher	Computers	Modes	P E M S T	Price
GEOMETRY	BRODERBUND	MC	DP,GG,TU	- - M S -	109.95
Manipulate geometric figures to create proofs; full-year geometry course					
GEOMETRY ALIVE!	ED'L ACTV	AP,IB,JR	TU	- E M S -	159.00
Introduces geometric concepts					
MONEY AND TIME ADVENTURES LOLLIPOP	SVE	AP	DP,EG	P E - - -	79.00
The Lollipop dragon teaches about time and money					
PATHFINDER	SUNBURST	AP,IB	EG,PS	- - M S -	65.00
Read and interpret graphs, and design routes for the ball to traverse					
PLANE VIEW	SUNBURST	AP,CO	PS,SI	- E M S -	65.00
Analyze top and bottom perspectives to determine the path of a block					
RIGHT TURN, THE	SUNBURST	AP,CO,IB,JR	EG,PS	- E M S -	59.00
Rotate and flip figures on a three-dimensional grid					
SUPER FACTORY, THE	SUNBURST	AP,CO,IB,JR,TC	CA,CP,PS,SI	- E M S -	59.00
Experiment with designs on a cube by using spatial geometry; 3-D version of THE FACTORY					
TEDDY'S PLAYGROUND	SUNBURST	AP	DP,EG	P - - - -	59.00
Practice in visual discrimination and analogies					
TELLING TIME	GAMCO	AP,CO,IB,TR	DP	P E - - -	44.95
Four lessons, each with four levels, cover analog and digital clocks					
TIME EXPLORERS	GAMCO	AP,CO,TR	DP,EG	P E - - -	44.95
Games for two players provide drill in telling time					
USING A CALENDAR	HARTLEY	AP	DP,TU	P E - - -	49.95
Illustrations, information, and questions about calendars, months, and holidays					
VOYAGE MIMI: MAPS AND NAVIGATION	HOLT R&W	AP	EG,PS,SI,TU	- E M - -	122.25
Apply mapping and navigational skills to rescue distressed whales					

MATHEMATICS - NUMBER

Title	Publisher	Computers	Modes	P E M S T	Price
see also INSTRUCTIONAL TOOLS - INSTRUCTIONAL MATERIALS GENERATOR section					
ADDITION LOGICIAN	MECC	AP	DP	P - - - -	49.00
Presents problems in a game format; focus on whole number addition and regrouping					
ADDITION MAGICIAN	TLC	AP,CO,IB,TC	DP,EG,PS	P E - - -	34.95
A set of games to provide practice in problem solving					
ADVENTURES WITH FRACTIONS	MECC	AP,CO	EG,TU	- E M - -	49.00
Introduces two methods of dealing with fractions; game format for practice					
ARITHMETIC CRITTERS	MECC	AP	DP,EG	P - - - -	55.00
Four games: addition, subtraction, measurement, and counting from 1 to 99					
BASIC MATH FACTS	HOUGHTON	AP	DP	P E M - -	99.00
Drill on basic arithmetic facts in all four operations					

Title	Publisher	Computers	Modes	P E M S T	Price
BOX SOLVES STORY PROBLEMS	SVE	AP	DP,PS	P E - - -	99.00
Story problems cover the basic arithmetic operations and how to select the correct operation					
CHALLENGE MATH	SUNBURST	CO	DP,EG	P E M - -	59.00
Calculating and estimating with whole numbers and decimals in a game format; editing option					
CIRCUS MATH	MECC	AP	DP	P - - - -	49.00
Several levels of addition programs with graphics; editing option					
CONQUERING WHOLE NUMBERS	MECC	AP	DP,EG	P E - - -	55.00
Math practice including BAGELS and TAX COLLECTOR					
COUNTING CRITTERS	MECC	AP	DP	P - - - -	55.00
Practice basic number skills using numbers from 1 to 20					
DECIMAL DISCOVERY	DLM	AP	DP,EG	- E M - -	46.00
Practice in a game format; student management; work sheet generator					
EARLY ADDITION	MECC	AP,AT	DP	P - - - -	49.00
Graphic sequences for practice in simple addition facts; editing option					
EDUCALC	GROLIER	AP,CO,IB,JR	PS,SD,TU	- E M S -	59.95
Designed-for-education spreadsheet; includes tutorial and instructional materials					
EDUCALC TEMPLATES	GROLIER	AP,CO,IB,JR	PS,SD	- E M S -	19.95
Spreadsheet files for use with *EDUCALC*					
ELLEN NELSON MATH 1	DECISION	AP,IB	DP	- E M - -	39.95
Practice basic math facts					
EXPRESSION WRITER	HRM SOFTWR	AP,IB	EG	- E M - -	49.95
Create numeric expressions to achieve arithmetic or algebraic goals					
FAST TRACK FRACTIONS	DLM	AP	DP,EG	- E M - -	46.00
Practice in a game format with student management; work sheet generator					
FRACTION CONCEPTS, INC.	MECC	AP	DP,PS	P E - - -	55.00
Students in a fraction factory cover terminology, making a whole, and equivalency					
FRACTION MUNCHERS	MECC	AP	DP,EG	P E M - -	55.00
Fractional numbers, equivalent fractions, and expressions; game format					
FRACTION PRACTICE UNLIMITED	MECC	AP	DP,PS	- E - - -	55.00
Reducing, comparing, and renaming fractions					
FRACTIONS: ADDITION AND SUBTRACTION	HOUGHTON	AP	DP,TU	- E M - -	105.00
Practice in computational skills; diagnostic component					
FRACTIONS: BASIC SKILLS	HOUGHTON	AP	DP,TU	- E M - -	105.00
Practice with introductory fraction skills					
GAMEFRAME: ONE AND TWO	HOUGHTON	AP	DP,EG,SH	P E M - T	252.00
Allows teachers to create activities from their own classroom curricula					
GEARS	SUNBURST	AP,IB,JR,TC	DP,EG,PS,SI	- E M S -	59.00
Predicting results and problem-solving with gears and rotations; scientific method					

Title	Publisher	Computers	Modes	P E M S T	Price
HOW THE WEST WAS ONE + THREE X FOUR	SUNBURST	AP	EG,PS	- E M S -	65.00
Problem-solving game using the order of operations and parenthesis					
KING'S RULE, THE	SUNBURST	AP,CO,IB,TC,TR	DE,EG,PS	- E M S -	59.00
Form and test hypotheses, recognize patterns, and develop problem-solving skills					
MARKET PLACE, THE	MECC	AP,CO,IB,TC	EG,SI	- E M - -	39.00
Economic simulations include selling apples, plants, lemonade, and bicycles					
MASTERING MATH SERIES	MECC	AP	DP,IM,TE	P E - - -	400.00*
Practice in basic math skills; diagnostic system; work sheet generator					
MATH ACTIVITIES COURSEWARE LV.1-8	HOUGHTON	AP	DP,EG	P E M - -	1320.00*
Series of programs in a game format to reinforce mathematics skills					
MATH PRACTICE LV.1	IBM	IB,JR,PS	DP	P E M - -	76.00
Practice with arithmetic operations using whole numbers, common fractions, and decimals					
MATH RABBIT	TLC	AP	DP,EG	P - - - -	54.95
Practice early number concepts in a series of four games					
MATH SEQUENCES, REVISED	MILLIKEN	AP,AT,PE,TR	DP	P E M - -	495.00*
Number readiness and four arithmetic operations with integers, fractions, and decimals					
MATH SHOP, THE	SCHOLASTIC	AP,IB,JR	EG,SI	- E M - -	69.95
Students help the proprietors with their math problems: inventory, sales, etc.					
MATH WORD PROBLEMS	OPTIMUM RES	AP	DP	- E M - -	39.95
More than 150 word problems in the basic operations; includes management					
MATH WORLDS: STRATEGIES I AND II	DC HEATH	AP	EG,PS	- E M S -	150.00*
Game of NIM; students can modify skill levels					
MATH: SOLVING STORY PROBLEMS LV.3-8	HOUGHTON	AP,IB	DP,PS	P E M - -	1746.00*
Presents Polya's problem-solving model and provides practice in solving story problems					
METEOR MISSION	DLM	AP	DP,EG,IM,SH	- E M - -	44.00
Multiplication game; user can create new game content					
METEOR MULTIPLICATION	DLM	AC,AP,AT,CO,IB	DP,EG	- E - - -	44.00
Practice in multiplying whole numbers; arcade game format with variable speed					
MONEY AND TIME ADVENTURES LOLLIPOP	SVE	AP	DP,EG	P E - - -	79.00
The Lollipop dragon teaches about time and money					
MONEY WORKS	MECC	AP	EG,PS	P E - - -	55.00
Learn the basics of handling and minting money					
MONEY! MONEY!	HARTLEY	AP,IB	DP,TU	P E - - -	39.95
Instruction and practice in counting money and making change; editing option					
MULTIPLICATION PUZZLES	MECC	AP	DP	P E - - -	55.00
Drill on multiplication facts and regrouping					
NUMBER FARM	DLM	AP,CO,IB,JR	DP,EG	P - - - -	29.95
Six musical games use animation to present and reinforce counting and number concepts					

Title	Publisher	Computers	Modes	P E M S T	Price
NUMBER MUNCHERS Practice number concepts in a game format	MECC	AP	DP,EG	P E M - -	55.00
NUMBER SEA HUNT Provides drill with counting, sequences, adding, and subtracting	GAMCO	AP,CO,TR	DP	P E - - -	44.95
PIECE OF CAKE MATH Five games set in a bakery; basic skills practice	SPRINGBOARD	AP,AT,CO	EG	P E - - -	29.95
POND, THE Problem-solving game involving pattern analysis	SUNBURST	AP,CO,IB,JR,TC	EG,PS	P E M - -	59.00
PRIMARY WORDMATH Teaches problem strategies: guess and check, exhaustive listing, and problem simplification	MILLIKEN	AP	DP,TU	- E M - -	95.00
PROBLEM SOLVING COMPUTER CW LV.5-8 Problem-solving in an adventure game format	MCGRAW HILL	AP	EG,PS	- E M - -	719.55*
PROBLEM SOLVING COMPUTER CW LV.K-4 A variety of games in different settings	MCGRAW HILL	AP	DP,EG,PS	P E - - -	326.85*
PUZZLE TANKS Practice math and logic skills by filling a large tank from a number of smaller tanks	SUNBURST	AP,CO,IB,JR,TR	EG,PS	- E M S -	59.00
QUOTIENT QUEST Drill on division facts with dividends of up to four digits	MECC	AP	DP	- E - - -	55.00
ROYAL RULES Form/test hypotheses, recognize patterns, develop problem-solving skills, and design challenges	SUNBURST	AP,IB	EG,PS,SH,SI	- E M S -	75.00
SAILING THROUGH STORY PROBLEMS Practice with whole number word problems in a game format	DLM	AP	DP,EG	P E M - -	46.00
SALINA MATH GAMES Covers four operations with whole numbers, fractions, decimals, and percents	ED'L ACTV	AP,TR	DP,EG	P E M S -	159.00
SEMCALC Tool to develop strategies for interpreting word problems in mathematics	SUNBURST	AP,AT,TR	DP,PS,TU	- E M S -	95.00
SOUTH DAKOTA User must employ math skills and critical thinking in a simulation of farm economics	ED'L ACTV	AP	PS,SI	- E M S -	63.00
SPACE SUBTRACTION Drill on subtraction facts and problems without regrouping	MECC	AP	DP,EG	P - - - -	55.00
SPEEDWAY MATH Basic skills problems in a race car format	MECC	AP	DP,EG	P E - - -	55.00
STICKYBEAR MATH 1 Activities to introduce and reinforce basic math concepts and skills	OPTIMUM RES	AP,CO	DP,EG	P - - - -	39.95
STICKYBEAR MATH 2 Practice in multiplication and division of whole numbers	OPTIMUM RES	AP	DP,EG	P E - - -	39.95
STICKYBEAR WORD PROBLEMS Practice with whole number word problems	OPTIMUM RES	AP	DP	P E - - -	39.95

Title	Publisher	Computers	Modes	P E M S T	Price
SURVIVAL MATH	SUNBURST	AP,AT,CO,TR	DP,EG,PS,SI	- E M S -	55.00
Includes HOT DOG STAND, an economic simulation of sales at a ball game					
SWEET SHOPPE	DC HEATH	AP,CO	DP,EG	P - - - -	45.00
Three games for single-digit addition, subtraction, and counting					
TEASERS BY TOBBS	SUNBURST	AP,AT,CO,IB,TR	DE,DP,EG,PS	- E M S -	59.00
Two programs to practice logical approaches to solving addition and multiplication problems					
UNDERSTANDING WORD PROBLEMS	SVE	AP	DP,TU	- E - - -	99.00
Multi-media approach to problem solving; filmstrips, skill sheets, and computer programs					
VOYAGE MIMI: ECOSYSTEMS	HOLT R&W	AP	PS,SI	- E M - -	122.25
Keep humans alive on an island by selecting food web from land, plant, and animal species					
WHATSIT CORPORATION	SUNBURST	AP,CO,TR	DP,EG,PS,SI	- E M S -	59.00
Use math skills to make group decisions to operate competitive businesses					
WHOLE NUMBERS: ADD. AND SUB.	HOUGHTON	AP	DP	P E M - -	105.00
Practice whole number add. and sub.; includes pretesting, remediation, and mastery testing					
WHOLE NUMBERS: MULT. AND DIVISION	HOUGHTON	AP	DP	- E M - -	105.00
Practice whole number mult. and div.; includes pretesting, remediation, and mastery testing					
WORDMATH 1-2	MILLIKEN	AP	DP,TU	- E M - -	95.00
Instruction and practice in strategies for solving word problems					
WORKSHEET WIZARD I-III	EDUSOFT	AP	IM	P E M S T	149.85*
Worksheet generators for whole numbers, fractions, and decimals					

MATHEMATICS - PROBLEM SOLVING

Title	Publisher	Computers	Modes	P E M S T	Price
see PROBLEM SOLVING/LOGIC section					

MATHEMATICS - STATISTICS

Title	Publisher	Computers	Modes	P E M S T	Price
DINOSAURS AND SQUIDS	SCOTT FORS	AP	EG,PS,SI	- E M - -	49.95
Strategies for solving problems that involve two variables					
EASY GRAPH II	GROLIER	AP,CO,IB	GG,TU	P E M - -	59.95
Produce pictographs, pie charts, and bar graphs; includes instructional materials					
EXPLORING TABLES AND GRAPHS I	OPTIMUM RES	AP	EG,GG,TU	- E M S -	34.95
Introduce the use of graphs; includes tool to construct graphs from a given set of data					
EXPLORING TABLES AND GRAPHS II	OPTIMUM RES	AP	EG,GG,TU	- E M S -	34.95
Real-life applications of tables and graphs; picture, bar, line, and area graphs					
MATH WORLDS: SAMPLING	DC HEATH	AP	CA,GG	- E M S -	75.00
Take statistical samples and study the effects of sample size					

Title	Publisher	Computers	Modes	P E M S T	Price
MECC GRAPH Generate pie charts, bar graphs, and line graphs	MECC	AP	GG	P E M S T	49.00
MECC GRAPHING PRIMER Tutorial for MECC GRAPH; has a writing activity on interpreting graphs	MECC	AP	GG,PS,TU	P E M S -	45.00
MIRRORS ON THE MIND-STATISTICS For estimating mean, standard deviation, and correlation coefficient from graph or plot	ADD WES	AP	DE,EG,PS	- E M S T	54.95
MIRRORS ON THE MIND-STRATEGIES Probabilistic games to define strategies, test hypotheses, and refine conjectures	ADD WES	AP	EG,PS	- E M S -	54.95
PROJECT ZOO Construct graphs, tables, and charts from information gathered at the zoo	NATIONAL GEO	AP	EG,PS,SI,TU	P E - - -	139.50
SPINNERS AND SLUGS Explore a variety of probabilistic situations	SCOTT FORS	AP	PS,SI	- E M - -	49.95
UNDERSTANDING CHARTS AND GRAPHS Practice in reading tables, and in constructing and intrepreting graphs and charts	SVE	AP	DP,TU	- E M - -	189.00

MUSIC

Title	Publisher	Computers	Modes	P E M S T	Price
ARNOLD Drill and practice of aural skills; dictation training	TEMPORAL	AP	DP	- E M S -	150.00
BANK STREET MUSICWRITER Create music and print the score	MINDSCAPE	AT,CO,IB	CA	P E M - -	49.95
CONCERTWARE+ Compose, play, and print music; allows users to customize instrument sounds	GREAT WAVE	MC	CA	- - - S -	69.95
DOREMI Training in aural identification of intervals of the major scales; requires DAC board	TEMPORAL	AP	DP,TU	- E M S -	75.00
HARMONIOUS DICTATOR Practice recognition of chord progressions; requires DAC board	TEMPORAL	AP	DP	- - - S -	150.00
JAM SESSION Harmonize with a four piece jazz ensemble	BRODERBUND	MC	CA	P E M S -	49.95
JAZZ DICTATOR Practice aural identification of chord progressions in a jazz style; requires DAC board	TEMPORAL	AP	DP	- E M S -	150.00
MAGIC PIANO Create original music; two drills on music concepts	EDUSOFT	AP	CA,DP	- E M S -	49.95
MELODIOUS DICTATOR Training in basic skills of melodic dictation; requires DAC board	TEMPORAL	AP	DE	- E M S -	150.00
MUSIC CONSTRUCTION SET Use icons to create, edit, and record music; uses musical notation	ELECTR ART	AP,CO,IB,MC	CA	P E M S T	39.95
MUSIC DETECTIVE, THE Develop perception of note, pitch, and duration; uses standard music notation	TEMPORAL	CO,MC	TU	- - - S -	60.00

Title	Publisher	Computers	Modes	P E M S T	Price
MUSIC FUNDAMENTALS I	SILVER	CO	CA,DP	- E M S -	43.50
Introduction to keyboard; read music and play on one octave keyboard					
MUSIC SHOP	BRODERBUND	CO	CA	- E M S -	49.95
User can create, play, and print musical compositions					
MUSIC STUDIO	MEDIAGENIC	AP,CO	CA	- E M S -	34.95
Create, edit, and record music on an Apple IIGS; uses a MIDI interface					
MUSIC THEORY	MECC	AP	CA,DP	- E M S -	49.00
Eighteen programs to drill on terms, notation, rhythm, pitch, chords, and scales					
MUSICWORKS	SPINNAKER	MC	CA	- E M S T	79.95
Create, play, and print musical scores					
POLYWRITER	PASSPORT	AP	CA	- E M S -	299.95
Notes on a MIDI keyboard are translated into musical notation; can display, edit, and print					
PRACTICAL THEORY	ALFRED MUSIC	AP,CO,IB	DP,TU	- - M S -	199.95
Sequential approach to music theory; textbook, disk, and workbook					
SIR WILLIAM WRONG-NOTE	TEMPORAL	AP	DP	- - - S -	150.00
Error recognition in a harmonic context of four-voice chords					
SONGWRITER	MINDSCAPE	AP,AT,CO,IB	CA,DP	- E M S -	39.95
Compose and rewrite complicated melodies without using musical notation					
SOUND TRACKS	MECC	AP	CA	P E - - -	55.00
Compose melodies and experiment with line, shapes, pictures, and colors					
TONEY LISTENS TO MUSIC	TEMPORAL	AP	DE,DP,EG	P E M S -	90.00
Ten levels of discrimination for tunes, interval, tempo, rhythm, and notation; requires DAC board					

PRESCHOOL/EARLY CHILDHOOD

Title	Publisher	Computers	Modes	P E M S T	Price
ALPHABET CIRCUS	DLM	AP,CO,IB,JR	DP,EG	P - - - -	29.95
Six musical games introduce and reinforce letter recognition skills					
ALPHABET EXPRESS	GAMCO	AP,CO,TR	DP	P - - - -	44.95
Drill and practice in alphabet skills					
COMPARISON KITCHEN	DLM	AP	DP,EG	P - - - -	29.95
Six games reinforce pre-reading and math skills of visual perception and discrimination					
COUNTERS	SUNBURST	AP	DP,EG,TU	P - - - -	59.00
Three games concretely provide 1-to-1 correspondence for counting, addition, and subtraction					
COUNTING CRITTERS	MECC	AP	DP	P - - - -	55.00
Practice basic number skills using numbers from 1 to 20					
DINOSAURS	ADV ID	AP,CO,IB	DP,EG	P - - - -	39.95
Match, sort, or count dinosaurs; covers habitats and feeding behavior					

Title	Publisher	Computers	Modes	P E M S T	Price
EARLY GAMES FOR YOUNG CHILDREN	SPRINGBOARD	AP,CO,IB,MC	DP,EG	P - - - -	34.95
Introduces shapes, letters, drawing, addition, and subtraction					
EARLY GAMES MATCHMAKER	SPRINGBOARD	AP,CO	EG,PS	P - - - -	29.95
Sequenced games to practice matching like and different shapes, or colors					
ERNIE'S MAGIC SHAPES	MINDSCAPE	CO,JR	DP,EG	P - - - -	34.95
Pre-reading skills; matching like shapes					
FIRST R	MILLIKEN	AP	TU	P - - - -	95.00
Phonetically-based word recognition program					
FIRST-LETTER FUN	MECC	AP	DP,EG	P - - - -	55.00
Practice letters with beginning sounds of words corresponding to pictures in the story					
FISH SCALES	DLM	AP	DP,EG	P - - - -	29.95
Six games with music and graphics to practice measurement skills					
FUN FROM A TO Z	MECC	AP	CA,EG	P - - - -	55.00
Letter discrimination, match uppercase and lowercase letters, and create pictures					
GERTRUDE'S PUZZLES	TLC	AP,AT,CO,IB,TC	EG,PS	P E M - -	59.95
Solve puzzles involving recognition of color and shape patterns					
GERTRUDE'S SECRETS	TLC	AP,AT,CO,IB,TC	EG,PS	P E - - -	59.95
Develop critical thinking skills by finding patterns in shapes and colors					
GETTING READY TO READ AND ADD	SUNBURST	AP,AT,CO,IB,JR	DP,EG	P - - - -	59.00
Drill in letter, number, and shape recognition					
JUGGLES' RAINBOW	TLC	AP,AT,CO,IB,TC	DP,EG	P - - - -	29.95
Reinforce the concepts of left and right, above and below					
KINDERCOMP	SPINNAKER	AP,AT,CO,IB,JR	DP,EG	P E - - -	29.95
Six games to help children get ready to read, spell, and count					
LEARNING ABOUT NUMBERS	C & C SOFT	AP	DP,EG	P E - - -	40.00
Practice and reinforcement for counting, simple time telling, and simple arithmetic					
LETTERS AND FIRST WORDS	C & C SOFT	AP	DP,EG	P - - - -	50.00
Letter recognition skills and short words; reinforce basic language skills					
LETTERS AND WORDS	MINDSCAPE	AP,IB,JR	DP,EG,TU	P - - - -	49.95
Alphabetizing, letter matches, and sight words; graphics; editing option; record keeping					
MOPTOWN HOTEL	TLC	AP,AT,CO,IB,TC	EG,PS	P E M - -	39.95
Users identify attribute patterns of Bibbets and Gribbets in this competitive logic game					
MOPTOWN PARADE	TLC	AP,AT,CO,IB,TC	EG,PS	P E M - -	39.95
Seven games to practice logical thinking, strategy development, and pattern recognition					
MUPPET SLATE	SUNBURST	AP	WP	P - - - -	75.00
Easy-to-use word processing program featuring pictures and borders					
MUPPET WORD BOOK THE	SUNBURST	AP	DP	P - - - -	65.00
Muppet characters introduce letters, words, and simple writing skills					
MUPPETS ON STAGE	SUNBURST	AP	CA,DP	P - - - -	99.00
To reinforce letter, number, and color recognition; comes with MUPPET LEARNING KEYS					

Title	Publisher	Computers	Modes	P E M S T	Price
MUPPETVILLE	SUNBURST	AP	DP	P - - - -	65.00
Kermit explores colors, shapes, numbers, and patterns in Muppetville					
NUMBER FARM	DLM	AP,CO,IB,JR	DP,EG	P - - - -	29.95
Six musical games use animation to present and reinforce counting and number concepts					
PAINT WITH WORDS	MECC	AP	CA,EG	P - - - -	55.00
Develop vocabulary and create pictures; Ufonic voice system optional; can be printed					
SHAPE AND COLOR RODEO	DLM	AP,CO,IB,JR	DP,EG	P - - - -	29.95
Six colorful games teach and reinforce recognition of shapes and colors					
STICKYBEAR ABC	OPTIMUM RES	AP,CO	DP,EG	P - - - -	39.95
Three games present word identification, order, and matching					
STICKYBEAR NUMBERS	OPTIMUM RES	AP,AT,CO	DP,EG	P - - - -	39.95
Simple Piagetian 1-to-1 correspondence presentation of numbers from 1 to 10					
STICKYBEAR OPPOSITES	OPTIMUM RES	AP,AT,CO	DP,EG,PS	P - - - -	39.95
Concepts of full/empty, up/down, in front of/behind					
STICKYBEAR SHAPES	OPTIMUM RES	AP,AT,CO	DP,EG	P - - - -	39.95
Identify, choose, and name shapes; figure-ground relationships					
TEDDY'S PLAYGROUND	SUNBURST	AP	DP,EG	P - - - -	59.00
Practice in visual discrimination and analogies					

PROBLEM SOLVING/LOGIC

Title	Publisher	Computers	Modes	P E M S T	Price
AI: EXPERIENCE ARTIFICIAL INTELLIGENCE	SCHOLASTIC	AP,IB,TA	PS,SI	- - M S T	69.95
Teach the computer game strategies and it learns and plays the game					
ALL SORTS OF MEGGLES	ED TECH	AP	DP,PS	P E - - -	75.00
Practice decision-making skills, testing, and record keeping; requires Ufonic voice synthesizer					
ANT FARM	SUNBURST	AP	EG,PS	- E M S -	65.00
Problem solving using patterns and sequences; varied levels of difficulty					
ARROW DYNAMICS	SUNBURST	AP	EG,PS	- E M - -	59.00
Logic game to practice logical thought and strategy formation					
BUILDING PERSPECTIVE	SUNBURST	AP,CO,IB,JR	EG,PS,SI	- E M S -	65.00
Program challenges spatial relationship problem-solving skills					
BUMBLE GAMES	TLC	AP,AT,CO,IB,TC	DP,EG,PS	P E - - -	54.95
Five programs introduce use of number pairs to describe positions in an array and on a grid					
BUMBLE PLOT	TLC	AP,CO,IB,TC	DP,EG,PS	- E M - -	39.95
Practice plotting and graphing skills on a coordinate grid (+10 to -10)					
CALLIOPE	INNOVISION	AP,MC	IT,PS,WP	- E M S T	59.95
Idea processor with word processing capabilities					
CODE QUEST	SUNBURST	AP,AT,CO,IB,TR	EG,PS	- E M - -	59.00
Decode clues to discover objects; use the mini-author to create new objects					

Title	Publisher	Computers	Modes	P E M S T	Price
COMPARISON KITCHEN	DLM	AP	DP,EG	P - - - -	32.95
Six games reinforce pre-reading and math skills of visual perception and discrimination					
CONCEPTOR	MENTOR LRN	AP,AT,CO,IB	EG,IT	- - M S -	59.95
Practice classifying information					
CREATIVITY UNLIMITED	SUNBURST	AP	CA	- E M - -	65.00
Develop flexible and original approaches; build, rotate, and expand objects					
CROSSCOUNTRY CANADA	DIDATECH	AP	EG,PS,SI	- E M S -	49.95
Simulated journey combines map reading, decision-making skills, and geography					
CROSSCOUNTRY USA	DIDATECH	AP	EG,PS,SI	- E M S -	49.95
Simulated journey combines map reading, decision-making skills, and geography					
CUBE BUILDER	HRM SOFTWR	AP	EG,PS	- E M S T	49.95
Manipulate 3-D cubes to build, enlarge, and rotate shapes					
DECISIONS, DECISIONS SERIES	TOM SNYDER	AP,IB	EG,PS,SI	- E M S -	839.65*
Series of role-playing simulations that require only one computer per class					
DINOSAURS AND SQUIDS	SCOTT FORS	AP	EG,PS,SI	P E - - -	49.95
Strategies for solving problems that involve two variables					
DISCOVERY LAB	MECC	AP	PS,SI	- E M S -	59.00
Design and conduct experiments to determine best environmental conditions for aliens					
DISCOVERY: EXPERIENCES W/SCI REASON	MILLIKEN	AP	PS,SI	- - - S -	150.00
A tool for developing scientific problem solving					
DISCRIMINATION ATTRIBUTES AND RULES	SUNBURST	AP	EG,PS	P E M - -	150.00
Presents discrimination as part of the problem-solving process					
ENCHANTED FOREST, THE	SUNBURST	AP,IB	EG,PS,SI,TU	- E M S -	59.00
Explore the concepts AND, OR, NOT; identify attributes of shape, color, and size					
EZ LOGO	MECC	AP	CP,PS,TU	P E - - -	49.00
Introduces a subset of Logo commands; separate Logo not required					
FACTORY, THE	SUNBURST	AP,AT,CO,IB,TC	EG,PS,SI	- E M S -	55.00
Practice visual discrimination, spatial perception, sequencing, and ordering skills					
FLYING CARPET, THE	LRNG TECH	AP,CO	EG,PS	P - - - -	19.95
Use triangles, squares, rectangles and other shapes to create objects					
FUN HOUSE MAZE	SUNBURST	AP	EG,PS	- E M S -	59.00
Practice pattern recognition and finding multiple solutions to three dimensional mazes					
GAME SHOW, THE	ADV ID	AC,AP,CO,IB,JR	IM,SH	P E M S T	39.95
Password format game; users may add their own subjects and words					
GEARS	SUNBURST	AP,IB,JR,TC	DP,EG,PS,SI	- E M S -	59.00
Predicting results and problem-solving with gears and rotations; scientific method					
GEOWORLD	TOM SNYDER	AP	DB,PS,SI	- E M S -	79.95
Simulates mining operations for selected minerals in various locations around the globe					

Title	Publisher	Computers	Modes	P E M S T	Price
GERTRUDE'S PUZZLES	TLC	AP,AT,CO,IB,TC	EG,PS	P E M - -	59.95
Solve puzzles involving recognition of color and shape patterns					
GERTRUDE'S SECRETS	TLC	AP,AT,CO,IB,TC	EG,PS	P E - - -	59.95
Develop critical thinking skills by finding patterns in shapes and colors					
GNEE OR NOT GNEE	SUNBURST	AP,CO,IB,TC	EG,PS	P E M - -	65.00
Game to develop visual discrimination and rule formation based on attributes					
HIDE 'N SEQUENCE	SUNBURST	AP,CO	IT,PS	- E M S T	75.00
Use problem solving strategies to practice sequencing skills in reading and writing					
HIGH WIRE LOGIC	SUNBURST	AP,IB,JR	EG,PS	- E M S -	59.00
Language-based critical thinking game for developing Boolean logic skills					
HOMETOWN: LOCAL AREA STUDY	ACTIVE LEARN	AP,CO,IB	DB,PS,SI	- - M S -	148.00
Students analyze demographic data relating to their own local information					
HOT DOG STAND	SUNBURST	IB,JR,TC	EG,PS,SI	P E M - -	59.00
Economic simulation of the operation of a hot dog stand at a football game					
IGGY'S GNEES	SUNBURST	AP	EG,PS	P E - - -	65.00
Practice discrimination strategies to solve increasingly complex problems					
INCREDIBLE LABORATORY, THE	SUNBURST	AP,AT,CO,TC	EG,PS,SI	- E M S -	59.00
Design experiments to determine the combination of chemicals needed to produce each monster					
JENNY'S JOURNEYS	MECC	AP	EG,PS,SI	- E - - -	55.00
Apply map-reading skills to a drive through a city					
KING'S RULE, THE	SUNBURST	AP,CO,IB,TC,TR	EG,PS	- E M S -	59.00
Form and test hypotheses, recognize patterns, and develop problem-solving skills					
LEGO TC LOGO	LEGO	AP	PS	P E M S -	495.00
Uses Lego building blocks with *LOGOWRITER* to program moveable objects					
LOGIC BUILDERS	SCHOLASTIC	AP	EG,PS	- E M S -	49.95
A series of challenges to improve memory and logic skills					
LOGOWRITER	LCSI	AP,IB,JR	CP,GG,WP	- E M S -	450.00
Integrates word processing with a version of the Logo programming language					
MEMORY CASTLE	SUNBURST	AP,CO,IB,JR,TC	EG,PS	- E M S -	59.00
A knight must remember and perform an increasing list of tasks to complete a mission					
MEMORY: A FIRST STEP	SUNBURST	AP,IB,JR	DP,PS	P E - - -	250.00
Puppet defines and introduces sequential problem-solving skills; includes non-computer activities					
MIND PUZZLES	MECC	AP	PS,SI	- - M S -	49.00
A set of graduated puzzles and tools to practice problem-solving strategies					
MINDSTRETCHER SERIES	ISL SOFTWR	AP,CO,PE	EG,PS	- E M S -	200.00*
Ten logic puzzles in game formats; for one or more players					
MOPTOWN HOTEL	TLC	AP,AT,CO,IB,TC	EG,PS	- E M S -	39.95
Users identify attribute patterns of Bibbets and Gribbets in this competitive logic game					
MOPTOWN PARADE	TLC	AP,AT,CO,IB,TC	EG,PS	P E M - -	39.95
Seven games to practice logical thinking, strategy development, and pattern recognition					

Title	Publisher	Computers	Modes	P E M S T	Price
ODELL LAKE Improved, updated simulation of food chains in a mountain lake	MECC	AP	EG,PS,SI	- E M - -	55.00
OH, DEER! Simulates the five-year management of a large herd of deer in a suburban community	MECC	AP	PS,SI,TU	- E M - -	49.00
OREGON TRAIL, THE Improved version of OREGON; simulates the 1850 trek west in a covered wagon	MECC	AP	EG,PS,SI	- E M - -	55.00
OTHER SIDE, THE Simulates conflicts between nations; objective is to negotiate conflict and build a bridge	TOM SNYDER	AP,IB	PS,SI	- - M S -	69.95
PINBALL CONSTRUCTION SET Design and construct pinball games by manipulating components on the screen	ELECTR ART	AP,AT,CO,IB,MC	AU,EG,PS	- E M S -	39.95
PLANETARY CONSTRUCTION SET Two activities have students experiment, explore, and create planets for specific life forms	SUNBURST	AP	EG,PS,SI	- - M S -	59.00
POND, THE Problem-solving game involving pattern analysis	SUNBURST	AP,CO,IB,JR,TC	EG,PS	P E M - -	59.00
PROBLEM-SOLVING STRATEGIES Two interactive tutorials introduce strategies of trial-and-error and exhaustive listing	MECC	AP	PS,TU	- - M S -	49.00
PUZZLE TANKS Practice math and logic skills by filling a large tank from a number of smaller tanks	SUNBURST	AP,CO,IB,JR,TR	EG,PS	- E M S -	59.00
QUATIONS Math game, based on SCRABBLE, for building equations rather than words	SCHOLASTIC	AP	DP,EG,PS	- E M S -	39.95
REGROUPING Educational game to practice regrouping by rules and attributes	SUNBURST	AP	EG,PS	P E - -	65.00
ROBOT ODYSSEY Use wires, logic gates, and circuit chips to design a robot that can escape from a maze	TLC	AP	CA,CP,EG,PS	- E M S -	49.95
ROCKY'S BOOTS Design circuit to recognize specific attributes using AND, NOT, OR, and flip-flop gates	TLC	AP	CP,EG,PS,SI	- E M S -	49.95
ROYAL RULES Deduce the rules for mathematical sequences	SUNBURST	AP,IB	PS,SI	- E M S -	75.00
SAFARI SEARCH Improve problem-solving and inference skills through a series of challenging activities	SUNBURST	AP,CO,IB	PS,SI	- E - - -	65.00
SEMCALC Tool to develop strategies for interpreting word problems in mathematics	SUNBURST	AP,AT,TR	DP,PS,TU	- - M S -	95.00
SOUND TRACKS Program combines graphics and music to create musical pictures	MECC	AP	CA	P E M - -	55.00
STICKYBEAR C"POSITES Concepts of full/ mpty, up/down, in front of/behind	OPTIMUM RES	AP,AT,CO	DP,EG,PS	P - - - -	39.95
STICKYBEAR SHAPES Identify, choose, and name shapes; figure-ground relationships	OPTIMUM RES	AP,AT,CO	DP,EG	P - - - -	39.95
STICKYBEAR TOWN BUILDER Practice map skills while building twenty different towns	OPTIMUM RES	AP,CO	EG,PS,SI	P - - - -	39.95

Title	Publisher	Computers	Modes	P E M S T	Price
STORY TREE	SCHOLASTIC	AP,CO,IB	CA,SH,WP	P E M S T	59.95
Three interactive stories; word processor for creating additional branching stories					
SUPER FACTORY, THE	SUNBURST	AP,CO,IB,JR,TC	CA,CP,PS,SI	- E M S -	59.00
Experiment with designs on a cube by using spatial geometry; 3-D version of *THE FACTORY*					
TEASERS BY TOBBS	SUNBURST	AP,AT,CO,IB,TR	DP,EG,PS	- E M S -	59.00
Two programs to practice logical approaches to solving addition and multiplication problems					
TEDDY'S PLAYGROUND	SUNBURST	AP	DP,EG	P - - - -	59.00
Practice in visual discrimination and analogies					
TEN CLUES	SUNBURST	AP	AU,EG,PS	P E M S -	65.00
Mini-authoring program stressing critcal versus variable attributes					
THINK QUICK	TLC	AP	EG,PS	P E M - -	69.95
Practice problem-solving skills while moving through a maze to collect parts of a puzzle					
TIC TAC SHOW	ADV ID	AC,AP,CO,IB,JR	AU,EG,IM,SH	P E M S T	39.95
Mini-authoring system allows teachers or students to develop HOLLYWOOD SQUARES game					
TIP 'N FLIP	SUNBURST	AP,IB	EG,PS	P E M - -	65.00
Practice discrimination skills by finding similarities and differences in patterns and orientations					
TONK IN THE LAND OF BUDDY-BOTS	MINDSCAPE	AP,CO,IB	EG,PS	P E - - -	19.95
Practice visual discrimination, concentration, memory, and problem-solving skills					
TRADING POST	SUNBURST	AP,CO,IB,JR,TC	EG,PS	P E M - -	59.00
Game for two students to reinforce visual discrimination, rule formation, analysis, and planning					
TRIVIA MACHINE	MECC	AP	DB,EG,PS,SI	- E M S -	49.00
Trivia game for developing data base thinking skills and keyword searching skills					
WHAT'S MY LOGIC	MIDWESTPC	AP,CO	EG,PS	- - M S -	39.95
Game practice in pattern recognition					
WHATSIT CORPORATION	SUNBURST	AP,CO,TR	DP,EG,PS,SI	- E M S -	59.00
Use math skills to make group decisions to operate competitive businesses					
WHERE IN USA IS CARMEN SANDIEGO?	BRODERBUND	AP	EG,PS,SI	- E M S -	44.95
Use FODOR'S GUIDE TO THE USA to search the USA and capture the criminal					
WHERE IN WORLD IS CARMEN SANDIEGO?	BRODERBUND	AP	EG,PS,SI	- E M S -	49.95
Use THE WORLD ALMANAC to search the world and capture the criminal					
ZOYON PATROL	MECC	AP	EG,PS,SI	- - M S -	55.00
Retrieve information from a database and make decisions within a timed structure					

SCIENCE - ASTRONOMY

Title	Publisher	Computers	Modes	P E M S T	Price
BANK STREET SCHOOL FILER: SPACE	SUNBURST	AP	DB,PS	- - M S -	59.00
Database file has information on planets and the history of astronomy					
PLANETARY CONSTRUCTION SET	SUNBURST	AP	EG,PS,SI	- - M S -	59.00
Two activities have students experiment, explore, and create planets for specific life forms					
SKY LAB	MECC	AP	DE,SI,TU	- E M - -	55.00
Simulate the motion of the sun, constellations, and planets relative to the earth					
SKY TRAVEL	COMMODORE	CO	DB,DE,SI	- - - S -	29.95
Present planetarium-type sky displays for any longitude, latitude, time, and date					

SCIENCE - BIOLOGY

Title	Publisher	Computers	Modes	P E M S T	Price
AGENTS OF INFECTION	PRENTICE	AP,IB,TA	DE,TU	- - M S -	69.00
Use simulated magnifying glass and microscope to identify bacteria and viruses					
BANK ST. SCHOOL FILER: ENDANGERED	SUNBURST	AP,CO	DB,PS	- - M S -	59.00
Database of endangered species worldwide; includes those extinct from 1600 to the present					
BIOFEEDBACK MICROLAB	HRM SOFTWR	AP,CO	IF	- - - S -	420.00
Interface package to measure heart rate, muscle tension, and electrodermal responses					
BIRDBREED	EDUTECH	AP	SI	- - M S -	110.00
Explore genetic principles for sixteen breeding groups of birds of defined phenotypes					
BODY ELECTRIC	HRM SOFTWR	AP,CO,IB,TR	IF	- - - S -	450.00
Use an interface card and electrodes to measure electrical activity from four areas of the body					
BODY TRANSPARENT	BRITANNICA	AP,CO,IB	DP,TU	- - M S -	39.95
Three activities about human body parts, function, and placement					
BOTANICAL GARDENS	SUNBURST	AP	PS,SI	- - M S -	59.00
Simulate plant growth by controlling temperature, light, water, and food					
CARDIOVASCULAR FITNESS LAB	HRM SOFTWR	AP,CO,IB	IF	- - M S -	210.00
Use the computer as a laboratory monitor of cardiovascular activity					
CATGEN	CONDUIT	AP	SI	- - M S -	75.00
Mate domestic cats of same genotype and observe their offspring					
CELL FUNCTIONS: GROWTH AND MITOSIS	IBM	IB	DP,TU	- - - S -	65.00
Animated tutorial on growth and mitosis; structure and function of animal cells					
CIRCULATION AND DIGESTION	MILLIKEN	AP	SI	- E M - -	95.00
Simulates digestive and circulatory systems; descriptions of functions					
CLASSIFICATION OF LIVING THINGS	ED'L ACTV	AP	DB,TU	- - M S -	63.00
Binomial nomenclature and scientific names used for classification					

Title	Publisher	Computers	Modes	P E M S T	Price
CLASSIFYING ANIMALS WITH BACKBONES	DC HEATH	AP	DB,TU	- - M S -	66.00
Classify zoo animals using a key and animal attributes					
DINOSAUR DAYS	TYC	AP	DP,TU	P E - - -	39.95
History, physical characteristics, and habitats of dinosaurs					
DINOSAUR DIG	MINDSCAPE	AP,CO,IB	DP,TU	P E M - -	49.95
Learn about dinosaurs; identification of pictures, characteristics, and geologic eras					
EXPERIMENTS IN HUMAN PHYSIOLOGY	HRM SOFTWR	AP,IB	IF	- - M S -	325.00
Lab equipment to measure respiration, skin temperature, heart rate, and reaction time					
EXPERIMENTS IN SCIENCE	HRM SOFTWR	AP,IB	IF	- - M S -	325.00
Interface package for experiments in biology, physics, chemistry, and earth science					
EXPLORE-A-SCIENCE: TYRANNOSAURUS	DC HEATH	AP	PS,TU	- E - - -	75.00
Learn about paleontology by reconstructing a Tyrannosaurus Rex					
GENETICS	MECC	AP	PS,SI	- - M - -	49.00
Experiment and conduct tests with imaginary bugs to explore genetic principles					
HEART ABNORMALITIES AND EKGs	FOCUS	AP	DE,TU	- - M S -	75.00
Demonstrate normal and abnormal EKG'S and heart abnormalities caused by different conditions					
HUMAN GENETIC DISORDERS	HRM SOFTWR	AP	PS,SI	- - - S -	49.95
Explore the inheritance patterns of 24 known human disorders					
LIFE SCIENCE DATABASE	SCHOLASTIC	AP	DB	- E M S -	99.95
Data files for PFS: FILE cover bird migration, animals, flowers, and drugs					
LIGHT, PLANTS AND PHOTOSYNTHESIS	IBM	IB,PS	TU	- - - S -	52.00
Explore light as energy and the characteristics of light used by chloroplasts in photosynthesis					
MENDELIAN GENETICS	IBM	IB,PS	DP,TU	- - - S -	52.00
Comprehensive tutorial on Mendelian theory and applications					
MICRO GARDENER	ED'L ACTV	AP	PS,SI	- E M - -	63.00
Grow geraniums and philodendrons by controlling light, water, temperature, and fertilizer					
NOW HEAR THIS	MARSHWARE	AP	TU	P E - - -	41.95
Reinforces fundamentals of hearing; covers major parts of the ear, its self-protection abilities, and sign language					
PATHOLOGY: DISEASES AND DEFENSES	IBM	IB,PS	TU	- - M S -	52.00
Describes infectious pathogens, causes of noninfectious diseases, body defense, and immunity					
SOLAR FOOD: EXPLAIN PHOTOSYNTHESIS	HRM SOFTWR	AP	SI,TU	- - - S -	69.00
Tutorial and simulated experiments to see how light, temperature, and carbon dioxide affect photosynthesis					
TOUCHY SUBJECT	MARSHWARE	AP	TU	- E - - -	39.95
Explore the nervous system through simulated experiments					

SCIENCE - CHEMISTRY

Title	Publisher	Computers	Modes	P E M S T	Price
CHEM LAB SIMULATIONS 1	HIGH TECH	AP,AT	SI	- - - S -	100.00
An acid-base titration simulation to determine endpoint, volume, and concentration					
CHEM LAB SIMULATIONS 2	HIGH TECH	AP	SI	- - - S -	100.00
Ideal gas law and entropy simulations					
CHEMICALS OF LIFE I: STRUCTURE	IBM	IB,JR,PS	TU	- - - S -	52.00
Interactive presentation of Bohr model of the atom, energy levels, ions, and ionic bonding					
COMBINING THE ELEMENTS	DC HEATH	AP	TU	- - M S -	75.00
Explore the composition and characteristics of elements and compounds as they are formed					
ENZYME INVESTIGATIONS	HRM SOFTWR	AP	SI,TU	- - - S -	49.95
Learn what enzymes are and how they operate					
EXPERIMENTS IN CHEMISTRY	HRM SOFTWR	AP	IF	- - - S -	455.00
Lab interface and probes for conducting fifteen chemistry experiments; teacher's guide					
EXPERIMENTS IN COLORIMETRY	HRM SOFTWR	AP	IF	- - - S -	239.00
Lab interface to graph data entered from spectrophotometer and a photodetector; teacher's guide					
EXPERIMENTS IN SCIENCE	HRM SOFTWR	AP,IB	IF	- - M S -	325.00
Interface package for experiments in biology, physics, chemistry, and earth science					
INTRO TO GENERAL CHEMISTRY	COMPRESS	AP,IB	DP,TU	- - M S -	590.00*
Series of ten supplementary computer activities for an introductory chemistry course					
MOLEC: MOLECULAR MODELING	COMPRESS	AP	PS,SI	- - - S -	149.95
Create, edit, display, and manipulate three-dimensional molecular models					
MOVING MOLECULES	HRM SOFTWR	AP	PS,SI	- - - S -	49.95
Effect of pressure and temperature on molecular motion in gases, liquids, solids; Boyle's and Charles' Laws					
PERIODIC TABLE: COMPUTER ASSISTED	COMPRESS	AP	PS,SI	- - - S -	50.00
Two demonstration programs represent and graph periodic properties of the elements					
PHYSICAL SCIENCE DATABASE	SCHOLASTIC	AP	DB	- E M S -	79.95
Data files for PFS: FILE; chemical compounds, reactions, chemical testing, glues and adhesives					

SCIENCE - EARTH SCIENCE

Title	Publisher	Computers	Modes	P E M S T	Price
ATARILAB STARTER SET	ATARI	AT	IF,SI	- - M - -	99.95
Lab interface to measure up to six modules at a time					
CHANGING EARTH, THE	DC HEATH	AP	PS,TU	- E M - -	66.00
Students collect data, perform tests, and make decisions as they analyze the earth's layers					
EARTHQUAKES	IBM	IB,JR	DP,TU	- - M S -	44.00
Comprehensive program shows relationship of earthquakes to other physical phenomena					

Title	Publisher	Computers	Modes	P E M S T	Price
EXPERIMENTS IN SCIENCE	HRM SOFTWR	AP,IB	IF	- - M S -	325.00
Interface package for experiments in biology, physics, chemistry, and earth science					
FORECAST	MINDSCAPE	AP,CO,IB,JR	DB,PS,SI	- - M S -	69.95
Make forecasts based on a data base of weather information for the U.S.A.					
GROUND WATER	IBM	IB	TU	- - M S -	49.00
Explore relationships among groundwater, the environment, and people					
HEAT ENERGY	DC HEATH	AP	PS,TU	- E M S -	66.00
Design a shelter to investigate problems of energy efficiency and structural design					
HYDROLOGIC CYCLE	IBM	IB	TU	- - - S -	49.00
Examine the human impact on the hydrologic cycle					
INFORMATION LAB SOFTWARE/EARTH SCIENCE	ADD WES	AP	DB,TU	- - M - -	60.00
Database research tool with tutorial on earth science topics					
LIFE IN THE OCEAN	DC HEATH	AP	SI	- E M - -	66.00
Simulation of scientists in a bathyscaph who collect and interpret data on marine life					
MICRO GARDENER	ED'L ACTV	AP	PS,SI	- E M - -	63.00
Grow geraniums and philodendrons by controlling light, water, temperature, and fertilizer					
SCIENCE TOOL KIT 2: EARTHQUAKE	BRODERBUND	AP	IF,SI,TU	- E M S -	39.95
Use with SCIENCE TOOL KIT master module to measure seismic activity; includes teacher's guide					
VOLCANOES	EARTHWARE	AP	PS,SI	- - M S -	49.50
Use research data to predict the eruption of a volcano					
VOLCANOES	IBM	IB,PS	SI,TU	- - - S -	44.00
Describes volcano formation, eruption, and prediction					
VOYAGE MIMI: MAPS AND NAVIGATION	HOLT R&W	AP	EG,PS,SI,TU	- E M S -	122.25
Apply mapping and navigational skills to rescue distressed whales					
WEATHER AND CLIMATE LAB	SCHOLASTIC	AP	DE,PS	- - M S -	59.95
Analyze, test, and hypothesize about relationships between geographic features and climate					

SCIENCE - ENVIRONMENTAL EDUCATION/ECOLOGY

Title	Publisher	Computers	Modes	P E M S T	Price
BANK ST. SCHOOL FILER: ENDANGERED	SUNBURST	AP,CO	DB,PS	- - M S -	59.00
Database of endangered species worldwide; includes those extinct from 1600 to the present					
ENVIRONMENT I: HABITATS/ECOSYSTEMS	IBM	IB,PS	DP,TU	- - - S -	52.00
Describes composition of ecosystems and examines effect of abiotic and biotic factors					
OH, DEER!	MECC	AP	PS,SI,TU	- E M - -	49.00
Simulates the five-year management of a large herd of deer in a suburban community					
SCIENCE #1: THE ENVIRONMENT	DECISION	AP,IB	SI,TU	- E M - -	49.95
Interactive tutorials and simulations cover the greenhouse effect, ecosystem, and energy					

Title	Publisher	Computers	Modes	P E M S T	Price
VOYAGE MIMI: ECOSYSTEMS	HOLT R&W	AP	PS,SI	- E M - -	122.25
Keep humans alive on an island by selecting food web from land, plant, and animal species					
VOYAGE MIMI: ISLAND SURVIVORS	HOLT R&W	AP	PS,SI	- E M - -	122.25
Survival simulation using food webs and predator-prey relationships					

SCIENCE - GENERAL SCIENCE

Title	Publisher	Computers	Modes	P E M S T	Price
ANIMAL PHOTO FUN	DLM	AP	SI,TU	- E M - -	29.95
Graphics and a safari game format introduce students to animals and their habitats					
ANT FARM	SUNBURST	AP	EG,PS	- E M S -	65.00
Predict ants' work stations and paths by using trial-and-error and analysis					
COMBINING THE ELEMENTS	DC HEATH	AP	TU	- - M S -	75.00
Explore the compositon and characteristics of elements and compounds as they are formed					
DINOSAUR DIG	MINDSCAPE	AP,CO,IB	DP,TU	P E M - -	49.95
Learn about dinosaurs; identification of pictures, characteristics, and geologic eras					
DISCOVERY LAB	MECC	AP	PS,SI	- E M S -	59.00
Design and conduct experiments to determine best environmental conditions for aliens					
DISCOVERY: EXPERIENCES W/SCI REASON	MILLIKEN	AP	PS,SI	- E M S -	150.00
A tool for developing scientific problem solving					
HEAT AND TEMPERATURE	HRM SOFTWR	AP	IF	- - M S -	395.00
Use interface and temperature probes to perform temperature experiments					
HEATH SCIENCE: EXPLORING HEAT	DC HEATH	AP	IF,TU	- E - - -	150.00
Present concepts of heat energy through experiments and discussion					
HEATH SCIENCE: EXPLORING MATTER	DC HEATH	AP	IF,TU	- E - - -	150.00
Study effects of heat on matter and molecular movement					
LIFE IN THE OCEAN	DC HEATH	AP	SI	- E M - -	66.00
Simulation of scientists in a bathyscaph who collect and interpret data on marine life					
MACHINES AND FORCE	DC HEATH	AP	SI,TU	- E M - -	66.00
Study simple machines by using simple mathematical operations					
ODELL LAKE	MECC	AP	EG,SI	- E M - -	55.00
Recently revised ecological and food web simulation in fresh-water lake					
PHYSICAL SCIENCE DATABASE	SCHOLASTIC	AP	DB	- E M S -	79.95
Data files for PFS: FILE; chemical compounds, reactions, chemical testing, glues and adhesives					
PROJECT ZOO	NATIONAL GEO	AP	EG,PS,SI,TU	P E - - -	139.50
Develop beginning directional skills through problem solving while exploring a zoo					
PSYCH LAB	HRM SOFTWR	AP	SI	- - - S -	49.95
Experiment with perception, memory, and learning as either experimentor or subject					

Title	Publisher	Computers	Modes	P E M S T	Price
SCIENCE TOOL KIT 1: SPEED/MOTION	BRODERBUND	AP	IF	- E M S -	39.95
Use with SCIENCE TOOL KIT master module to measure velocity and acceleration					
SCIENCE TOOL KIT MASTER MODULE	BRODERBUND	AP	IF,SI,TU	- E M S -	79.95
Interfacing package to measure temperature, light, speed, and response time; includes teacher's guide					
SIMPLE MACHINES	MICRO P&L	AP	PS,TU	P E - - -	29.95
Principles and applications of lever, pulley, inclined plane, wheel, wedge, and screw					
SMELL & TELL	MARSHWARE	AP	TU	- E - - -	39.95
Graphic introduction to link between taste and smell and how taste buds work					
VOYAGE MIMI: ISLAND SURVIVORS	HOLT R&W	AP	PS,SI	- E M - -	122.25
Survival simulation using food webs and predator-prey relationships					
VOYAGE MIMI: MAPS AND NAVIGATION	HOLT R&W	AP	EG,PS,SI,TU	- E M S -	122.25
Apply mapping and navigational skills to rescue distressed whales					
WHO AM I?	FOCUS	AP	PS	- E - - -	45.00
Identification game in which students identify an organism by analyzing clues					

SCIENCE - PHYSICS

Title	Publisher	Computers	Modes	P E M S T	Price
CIRCUIT LAB	MARK DAVIDS	AP,AT	PS,SI	- - M S -	24.95
Build and analyze parallel and series electrical circuits					
EXPERIMENTS IN SCIENCE	HRM SOFTWR	AP,IB	IF	- - M S -	325.00
Interface package for experiments in biology, physics, chemistry, and earth science					
GLIDEPATH	HRM SOFTWR	AP	SI	- - M - -	49.95
Simulate flight of glider over imaginary terrain that includes mountains, forests, and deserts					
INVESTIGATING ACCELERATION	IBM	IB,PS	TU	- - - S -	60.00
Gather data and manipulate variables to observe effects of acceleration					
INVESTIGATING ELECTRIC FIELDS	IBM	IB,PS	TU	- - - S -	60.00
Collect data and manipulate variables to explore laws of electricity					
INVESTIGATING GRAVITATIONAL FORCE	IBM	IB,PS	TU	- - - S -	60.00
Collect data and manipulate variables to explore the law of gravity					
LIGHT LAB	CREATIVE TEC	AP,CO	IF	- - M S -	50.00
Interfacing package to measure light intensity					
MOTION	HRM SOFTWR	AP	DE,IF,SM	- - - S -	289.00
Motion Probe measures and plots position, velocity, and acceleration					
MOVING MOLECULES	HRM SOFTWR	AP	SI	- - M S -	49.95
Effect of pressure and temperature on molecular motion in gases, liquids, solids; Boyle's and Charles' Laws					
OPTICS ON COMPUTER: PHYSICAL SCIENCE	FOCUS	AP	DE	- - - S -	65.00
Two programs demonstrate properties and operation of lenses and refraction					

Title	Publisher	Computers	Modes	P E M S T	Price
SCIENCE TOOL KIT 1: SPEED/MOTION	BRODERBUND	AP	IF	- E M S -	39.95
Use with *SCIENCE TOOL KIT* master module to measure velocity and acceleration					
SCIENCE TOOL KIT MASTER MODULE	BRODERBUND	AP	IF,SI,TU	- E M S -	79.95
Interfacing package to measure temperature, light, speed, and response time; includes teacher's guide					
SIMPLE MACHINES	MICRO P&L	AP	PS,TU	P E - - -	29.95
Principles and applications of lever, pulley, inclined plane, wheel, wedge, and screw					
SOUND: A MICROCOMPUTER-BASED LAB	HRM SOFTWR	AP	IF	- - M S -	265.00
Experiments using interface to measure, analyze, and display images of sounds					
TEMPERATURE EXPERIMENTS	HARTLEY	AP,CO	IF	P E M S -	69.95
Interfacing package to measure temperature with two probes					

SCIENCE - SCIENTIFIC METHOD/LAB EQUIPMENT

Title	Publisher	Computers	Modes	P E M S T	Price
ATARILAB STARTER SET	ATARI	AT	IF,SI	- - M - -	99.95
Lab interface to measure up to six modules at a time					
BODY ELECTRIC	HRM SOFTWR	AP,CO,IB,TR	IF	- - M S -	450.00
Use an interface card and electrodes to measure electrical activity from four areas of the body					
CARDIOVASCULAR FITNESS LAB	HRM SOFTWR	AP,CO,IB	IF	- - M S -	210.00
Use the computer as a laboratory monitor of cardiovascular activity					
COLORTROPE	HRM SOFTWR	AP,IB,JR	TU	- - - S -	79.95
Use the computer screen to explore principles of light and color					
DISCOVERY LAB	MECC	AP	PS,SI	- E M S -	59.00
Design and conduct experiments to determine best environmental conditions for aliens					
DISCOVERY: EXPERIENCES W/SCI REASON	MILLIKEN	AP	PS,SI	- E M S -	150.00
A tool for developing scientific problem solving					
FREQUENCY METER	VERNIER	AP	IF	- - - S -	39.95
Interface package to measure, display, and store audio frequencies					
GRAPHICAL ANALYSIS III	VERNIER	AP	GG,IF,PS	- - - S T	24.95
Plots graphs of experimental data and allows students to analyze results					
HEAT AND TEMPERATURE	HRM SOFTWR	AP	IF	- - M S -	395.00
Use interface and temperature probes to perform temperature experiments					
HOW TO BUILD A BETTER MOUSETRAP	VERNIER	AP	IF	- - M S -	24.95
Student-built interfacing experiments for science projects					
INCREDIBLE LABORATORY, THE	SUNBURST	AP,AT,CO,TC	EG,PS,SI	- E M S -	59.00
Design experiments to determine the combination of chemicals needed to produce each monster					

Title	Publisher	Computers	Modes	P E M S T	Price
LIGHT LAB	CREATIVE TEC	AP,CO	IF	- - M S -	50.00
Interfacing package to measure light intensity					
SCIENCE TOOL KIT 1: SPEED/MOTION	BRODERBUND	AP	IF	- E M S -	39.95
Use with *SCIENCE TOOL KIT* master module to measure velocity and acceleration					
SCIENCE TOOL KIT MASTER MODULE	BRODERBUND	AP	IF,SI,TU	- E M S -	79.95
Interfacing package to measure temperature, light, speed, and response time; includes teacher's guide					
TEMPERATURE EXPERIMENTS	HARTLEY	AP,CO	IF	P E M S -	69.95
Interfacing package to measure temperature with two probes					
VOYAGE MIMI: WHALES & ENVIRONMENT	HOLT R&W	AP	IF	- E M - -	374.25
Probe kit for measuring temperature, light, and sound; includes *BANK STREET LAB*					

SOCIAL SCIENCE - ECONOMICS

Title	Publisher	Computers	Modes	P E M S T	Price
ELECTRONIC MONEY	MECC	AP,CO,IB	DP,SI,TU	- E M - -	36.00
Practice in recognizing specific uses of electronic money transactions in business					
FACTORY, THE	SUNBURST	AP,AT,CO,IB,TC	EG,PS,SI	- E M S -	55.00
Practice visual discrimination, spatial perception, sequencing, and ordering skills					
GEOWORLD	TOM SNYDER	AP	DB,PS,SI	- E M S -	79.95
Simulates mining operations for selected minerals in various locations around the globe					
HOT DOG STAND	SUNBURST	IB,JR,TC	EG,PS,SI	- E M S -	59.00
Economic simulation of the operation of a hot dog stand at a football game					
MARKET PLACE, THE	MECC	AP,CO,IB,TC	EG,SI	- E M - -	39.00
Economic simulations include selling apples, plants, lemonade, and bicycles					
OTHER SIDE, THE	TOM SNYDER	AP,IB	PS,SI	- - M S -	69.95
Simulates conflicts between nations; objective is to negotiate conflict and build a bridge					

SOCIAL SCIENCE - GEOGRAPHY

Title	Publisher	Computers	Modes	P E M S T	Price
BANK STREET SCHOOL FILER: NORTH AM.	SUNBURST	AP,CO	DB	- - M S -	99.00
Database files on social studies topics for North American countries					
BANK STREET SCHOOL FILER: U.S.	SUNBURST	AP,CO	DB	- - M S -	59.00
Database files on social studies topics for each state of the U.S.A.					
CROSSCOUNTRY CALIFORNIA	DIDATECH	AP	EG,PS,SI	- E M S -	49.95
Simulated travel from city to city throughout California					
CROSSCOUNTRY CANADA	DIDATECH	AP	EG,PS,SI	- E M S -	49.95
Simulated travel across Canada; utilizes reference materials					

Title	Publisher	Computers	Modes	P E M S T	Price
CROSSCOUNTRY TEXAS	DIDATECH	AP	EG,PS,SI	- E M S -	49.95
Simulated travel from city to city throughout Texas					
CROSSCOUNTRY USA	DIDATECH	AP	EG,PS,SI	- E M S -	49.95
Simulated journey combines map reading, decision-making skills, and geography					
DATAQUEST: THE FIFTY STATES	MECC	AP	DB	- E M S -	55.00
Questions on geography, demographics, climate, economics, and history; editing option					
GEOWORLD	TOM SNYDER	AP	DB,PS,SI	- E M S -	79.95
Simulates mining operations for selected minerals in various locations around the globe					
ONE WORLD: COUNTRIES DATABASE	ACTIVE LEARN	AP,CO,IB	DB	- E M S -	48.00
Information on all nations of the world; includes maps and activity sheets					
SEE THE U.S.A.	COMPU-TEACH	AP,IB	DP	- E M - -	49.95
Introduces the political geography of the U.S.A.					
STATES AND CAPITALS	GAMCO	AP,CO,TR	DP	- E M - -	54.95
Guided drill in basic geography skills of the U.S.A.					
UNLOCKING THE MAP CODE	RAND MCNLY	AP,AT	EG,TU	- E M - -	111.00
Six units to review land and water forms and to interpret map symbols					
USA PROFILE	ACTIVE LEARN	AP,CO,IB	DB	- - M S -	148.00
Database of information on all 50 states; includes maps and activity sheets					
WHERE IN EUROPE IS CARMEN SANDIEGO?	BRODERBUND	AP,IB	EG,PS,SI	- E M S -	54.95
Use the CONCISE ATLAS OF EUROPE to search Europe and capture the criminal					
WHERE IN USA IS CARMEN SANDIEGO?	BRODERBUND	AP	EG,PS,SI	- E M S -	44.95
Use FODOR'S GUIDE TO THE USA to search the USA and capture the criminal					
WHERE IN WORLD IS CARMEN SANDIEGO?	BRODERBUND	AP	EG,PS,SI	- E M S -	49.95
Use THE WORLD ALMANAC to search the world and capture the criminal					

SOCIAL SCIENCE - GOVERNMENT/POLITICAL SCIENCE

Title	Publisher	Computers	Modes	P E M S T	Price
AND IF RE-ELECTED . . .	FOCUS	AP,IB	SI	- - M S -	65.00
Role-playing simulation involving goverment decision-making					
BALANCE OF POWER	MINDSCAPE	AM,IB,MC	SI	- - M S -	59.95
Learn world politics by role-playing world powers					
DATAQUEST: THE PRESIDENTS	MECC	AP	DB	- - M S -	55.00
Database of facts about the American presidents					
DECISIONS, DECISIONS: BUDGET PROCESS	TOM SNYDER	AP,IB	PS,SI	- - M S -	119.95
Simulates the issues and pressures of the federal budgeting process					

Title	Publisher	Computers	Modes	P E M S T	Price
DECISIONS, DECISIONS: FOREIGN POLICY	TOM SNYDER	AP,IB	PS,SI	- - M S -	119.95
Simulation focusing on U.S.A. foreign policy issues and decision-making process					
NEWSWORKS	NEWSWEEK	AP	DB	- - M S -	0.00
APPLEWORKS data disk available free with NEWSWEEK subscription					
OTHER SIDE, THE	TOM SNYDER	AP,IB	PS,SI	- - M S -	69.95
Simulates conflicts between nations; objective is to negotiate conflict and build a bridge					
OUR TOWN MEETING	TOM SNYDER	AP,IB	PS,SI	- - M S -	79.95
Simulates negotiating for available resources; lesson in civic responsiblity					
TO PRESERVE, PROTECT, AND DEFEND	MECC	AP	PS,SI	- - M S -	55.00
Students must protect the US Constitution the night before it is signed					
US CONSTITUTION THEN AND NOW	SCHOLASTIC	AP	DB,SI	- - M S -	59.95
Databases and activities for teaching constitutional issues					
US GOVERNMENT DATABASE	SCHOLASTIC	AP,IB	DB	- - M S -	99.95
A coilection of data and database activities; requires PFS: FILE/REPORT					

SOCIAL SCIENCE - HISTORY

Title	Publisher	Computers	Modes	P E M S T	Price
see also INSTRUCTIONAL TOOLS - DATABASE section					
49ERS, THE	HARTLEY	AP	EG,SI	- E M - -	79.95
Simulation activity for westward expansion					
ARCHAEOLOGY SEARCH	MCGRAW HILL	AP,TR	EG,SI	- - M S -	180.00
Team involvement for planning and problem-solving in an archeological dig simulation					
CROSSCOUNTRY USA	DIDATECH	AP	EG,PS,SI	- E M S -	49.95
Simulated journey combines map reading, decision-making skills, and geography					
DECISIONS, DECISIONS: COLONIZATION	TOM SNYDER	AP,IB	EG,PS,SI	- - M S -	119.95
Simulates colonization in the future, with historical references					
DECISIONS, DECISIONS: IMMIGRATION	TOM SNYDER	AP,IB	PS,SI	- E M S -	119.95
Simulation of immigration policy decision-making for uninvited refugees					
DECISIONS, DECISIONS: REVOLUT. WAR	TOM SNYDER	AP,IB	PS,SI	- - M S -	119.95
Simulates responding to a revolution from the viewpoint of the government					
GOLDEN SPIKE, THE	NATIONAL GEO	AP,IB	EG,PS,SI	- E M - -	109.95
Multi-media simulation of westward expansion and building of the transcontinental railroad					
HOMETOWN: LOCAL AREA STUDY	ACTIVE LEARN	AP,IB,CO	DB,PS,SI	- - M S -	148.00
Students analyze demographic data relating to their own local information					
IMMIGRANT	ETC	AP	DB	- - M S -	20.00
APPLEWORKS data disk and lesson activities concerning Irish immigration to Boston in the 1800s					

Title	Publisher	Computers	Modes	P E M S T	Price
JENNY'S JOURNEYS Apply map-reading skills to a drive through a city	MECC	AP	EG,PS,SI	- E M - -	55.00
LINCOLN'S DECISIONS User is challenged to respond creatively to the choices that Abraham Lincoln faced as president	ED'L ACTV	AP,CO,IB,JR,TR	SI	- E M S -	63.00
OREGON TRAIL, THE Improved version of OREGON; simulates the 1850 trek west in a covered wagon	MECC	AP	EG,PS,SI	- E M - -	55.00
RIPPLE THAT CHANGED AMERICAN HISTORY A timeline adventure game used to stimulate historical research	TOM SNYDER	AP,IB	BG	- - M S -	69.95
TIME TUNNEL Simulation allows students to travel back in time and interact with famous Americans	FOCUS	AP,CO,IB,TR	SI	- - M S -	99.00
TIMELINER Produces printed chronology of historical events, students' lives, etc.	TOM SNYDER	AP	IM	- E M S T	59.95
US HISTORY DATABASE A collection of data and database activities; requires PFS: FILE/REPORT	SCHOLASTIC	AP,IB	DB	- E M S -	99.95

SOCIAL SCIENCE - SOCIOLOGY

Title	Publisher	Computers	Modes	P E M S T	Price
DECISIONS, DECISIONS: TELEVISION Simulation investigates the ethics of presenting violent programming for young children	TOM SNYDER	AP,IB,	PS,SI	- - M S -	119.95
DECISIONS, DECISIONS: URBANIZATION Simulates conflict of growth versus resources versus quality of life	TOM SNYDER	AP,IB	PS,SI	- - M S -	119.95
STICKYBEAR TOWN BUILDER Practice map skills while building twenty different towns	OPTIMUM RES	AP	EG,PS,SI	P E - - -	39.95
SURVEY TAKER Allows development of 50-question survey to be completed on-line; results may be graphed	SCHOLASTIC	AP	DB,SH,TE	- E M S T	29.95

TESTS AND TESTING

Title	Publisher	Computers	Modes	P E M S T	Price
COMPUTER PREPARATION FOR THE SAT Practice problems to prepare for SAT exams	HBJ	AP,IB,TR	DP,TE	- - - S -	39.95
MASTERING THE ACT Practice tests for ACT exams; for up to seven students	MINDSCAPE	AP,CO,IB	DP,TE	- - - S -	109.95

VOCATIONAL EDUCATION/INDUSTRIAL ARTS

Title	Publisher	Computers	Modes	P E M S T	Price
GLIDEPATH	HRM SOFTWR	AP	SI	- - M S -	49.95
Simulate flight of student-designed glider over imaginary terrain that includes mountains, forests, and deserts					
TOY SHOP	BRODERBUND	AP,CO,IB,MC	CA,GG	- - M S T	49.95
Graphics package that prints plans for 3-D toys; can be edited					

WORLD LANGUAGES - FRENCH

Title	Publisher	Computers	Modes	P E M S T	Price
EN VACANCES	DC HEATH	AP	DP,SI	- - M S -	108.00
Introduces the language and customs of traveling in the French-speaking world					
EN VILLE	DC HEATH	AP	DP,SI	- - - S -	108.00
Practice giving and following directions in French					
GUIDE DE L'ENSEIGNANT	MECC	AP	DP,SH,TE	P E M S T	49.00
Create and edit multiple choice, T-F, or short-answer exercises in any subject area					
LES SPORTS	DC HEATH	AP	DP,SI	- - - S -	108.00
A tour of French sports and entertainment					
M-SS-NG L-NKS: LE MOT JUSTE	SUNBURST	IB,JR	EG,PS,SH	- E M S T	69.00
Complete a passage that appears on the screen with letters omitted					
PARIS EN METRO	DC HEATH	AP	DP,SI	- - - S -	108.00
Introduces students to the Paris Metro					
PROFESSION: DETECTIVE	GESSLER	AP,CO	BG	P E M - -	39.95
Explore the French language by solving this SNOOPER TROOPS mystery					
TICKET TO PARIS	BLUE LION	AP,CO,IB	SI	- - M S -	49.95
A simulated immersion into Parisian life					
UN REPAS FRANCAIS	DC HEATH	AP	DP,SI	- - - S -	108.00
A simulation of a typical French meal					

WORLD LANGUAGES - GERMAN

Title	Publisher	Computers	Modes	P E M S T	Price
M-SS-NG L-NKS: WORTSPIEL	SUNBURST	IB,JR	EG,PS,SH	- E M S T	69.00
Complete a passage that appears on the screen with letters omitted					

WORLD LANGUAGES - SPANISH

ANAGRAMAS HISPANOAMERICANOS	GESSLER	AP	DP,EG	- E M S -	39.95
Geographic review; proper spelling in Spanish of capitals and countries of Latin America					
EJERCICIOS DE MATEMATICAS	MECC	AP	DP,EG,PS	P E - - -	39.00
Spanish version of *MECC ELEMENTARY VOLUME 1*					

Title	Publisher	Computers	Modes	P E M S T	Price
EL ASISTENTE DEL INSTRUCTOR	MECC	AP	DP,SH,TE	- E M S T	49.00
Create and edit multiple choice, T-F, or short-answer exercises in any subject area					
EL MUNDO HISPANICO	DC HEATH	AP	DP,SI	- - M S -	132.00
Introduces various hispanic countries, their capitals, and inhabitants					
JUEGOS COMUNICATIVOS	RANDOM	AP	DP,EG	- - M S -	59.95
Provides a form of integrated communicative practice in Spanish					
SPANISH FREDWRITER	ED'L ACTV	AP	WP	P E M S -	40.00
Full-featured Spanish version of *FREDWRITER*; requires Spanish Wiz-Chip					
TICKET TO SPAIN	BLUE LION	AP,CO,IB	SI	- - M S -	49.95
A simulated immersion into Spanish life					
UN DIA EN MADRID	DC HEATH	AP	DP,SI	- - M S -	120.00
Introduces the culture and language of Madrid					
UN DIA TIPICO	DC HEATH	AP	DP,SI	- - M S -	132.00
A simulation of a typical day in Spain					
UN VIAJE EN TREN	DC HEATH	AP	DP,SI	- - M S -	132.00
A simulation of a train trip through a Spanish-speaking country					
UNA FIESTA	DC HEATH	AP	DP,SI	- - M S -	120.00
Introduces vocabulary and cultural items					
UNA VISITA A MEXICO	DC HEATH	AP	DP,SI	- - M S -	132.00
An exploration of Mexican culture and language					

WORLD LANGUAGES - LANGUAGE TOOL

Title	Publisher	Computers	Modes	P E M S T	Price
see also INSTRUCTIONAL TOOLS - INSTRUCTIONAL MATERIALS GENERATOR section					
ALEXANDER	GESSLER	IB,JR	WP	- - M S T	245.00
Multilingual word processor that supports math, science, and music notation					
DASHER	CONDUIT	AP	AU,DP,IM	- E M S T	150.00
Create drills for language students with German, French, and Spanish starter disks					
GUTENBERG	GESSLER	AP,IB	WP	- - M S T	99.00
Text editor with French, Spanish, German, and ten other language fonts					

ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
49ERS, THE	HARTLEY	SS	HI
816/PAINT	BAUDVILLE	AT	
A-PLUS: THE HOMEWORK SOLUTION	SAVTEK CORP	IT	SA
ACE REPORTER	MINDPLAY	LA	
ADDITION LOGICIAN	MECC	MA	NU
ADDITION MAGICIAN	TLC	MA	NU
ADOBE ILLUSTRATOR	ADOBE	AT	
ADVENTURE CONSTRUCTION SET	ELECTR ART	LA	
ADVENTURES WITH FRACTIONS	MECC	MA	NU
AGENTS OF INFECTION	PRENTICE	SC	BL
AI: EXPERIENCE ARTIFICIAL INTELLIGENCE	SCHOLASTIC	PS	
ALCOHOL 'THE PARTY'	MARSHWARE	HL	
ALEXANDER	GESSLER	WL	LT
ALGE-BLASTER!	DAVIDSON	MA	AL
ALGEBRA GRAF(X)	ACTIVE LEARN	MA	AD
ALGEBRA GRAF(X)	ACTIVE LEARN	MA	AL
ALGEBRA SHOP, THE	SCHOLASTIC	MA	AL
ALGEBRAIC PROPOSER	TRUE BASIC	MA	AL
ALICE IN WONDERLAND	HRM SOFTWR	LA	
ALL SORTS OF MEGGLES	ED TECH	CS	
ALL SORTS OF MEGGLES	ED TECH	PS	
ALPHABET CIRCUS	DLM	PR	
ALPHABET EXPRESS	GAMCO	PR	
ALPHABETIC KEYBOARDING	SW PUB	BE	TY
ALPHABETIC KEYBOARDING	SW PUB	KB	
ANAGRAMAS HISPANOAMERICANOS	GESSLER	WL	SP
AND IF RE-ELECTED . . .	FOCUS	SS	GO
ANIMAL PHOTO FUN	DLM	SC	GS
ANIMATE	BRODERBUND	AT	
ANT FARM	SUNBURST	PS	
ANT FARM	SUNBURST	SC	GS
APPLE LOGO II	APPLE	CS	
APPLEWORKS	CLARIS	IT	DB
APPLEWORKS	CLARIS	IT	SD
APPLEWORKS	CLARIS	IT	WP
ARBPLOT	CONDUIT	IT	IM
ARCHAEOLOGY SEARCH	MCGRAW HILL	SS	HI
ARITHMETIC CRITTERS	MECC	MA	NU
ARNOLD	TEMPORAL	MU	
ARROW DYNAMICS	SUNBURST	PS	
ATARILAB STARTER SET	ATARI	SC	ES
ATARILAB STARTER SET	ATARI	SC	SM
AUTHOR! AUTHOR!	MINDPLAY	LA	
AUTOMATED ACCOUNTING	SW PUB	BE	AC
AWARD MAKER PLUS	BAUDVILLE	IT	GG
BAKE AND TASTE	MINDPLAY	MA	GM
BALANCE OF POWER	MINDSCAPE	SS	GO
BANK STREET FILER	BRODERBUND	IT	DB
BANK STREET MUSICWRITER	MINDSCAPE	IT	IM
BANK STREET MUSICWRITER	MINDSCAPE	MU	
BANK STREET SCHOOL FILER	SUNBURST	IT	DB
BANK STREET SCHOOL FILER: ENDANGERED	SUNBURST	SC	BL

ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
BANK STREET SCHOOL FILER: ENDANGERED	SUNBURST	SC	EE
BANK STREET SCHOOL FILER: NORTH AM.	SUNBURST	SS	GE
BANK STREET SCHOOL FILER: SPACE	SUNBURST	SC	AY
BANK STREET SCHOOL FILER: U.S.	SUNBURST	SS	GE
BANK STREET STORYBOOK	MINDSCAPE	IT	WP
BANK STREET WRITER III	SCHOLASTIC	IT	WP
BANK STREET WRITER III	SCHOLASTIC	LA	
BANK STREET WRITER PLUS	BRODERBUND	IT	WP
BASIC MATH FACTS	HOUGHTON	MA	NU
BASICS OF BASIC	FOCUS	CS	
BE A WRITER!	SUNBURST	LA	
BIOFEEDBACK MICROLAB	HRM SOFTWR	SC	BL
BIRDBREED	EDUTECH	SC	BL
BLAZING PADDLES	BAUDVILLE	AT	
BLAZING PADDLES	BAUDVILLE	IT	GG
BODY ELECTRIC	HRM SOFTWR	HL	
BODY ELECTRIC	HRM SOFTWR	SC	BL
BODY ELECTRIC	HRM SOFTWR	SC	SM
BODY TRANSPARENT	BRITANNICA	SC	BL
BOOK WORM	MECC	LM	
BOTANICAL GARDENS	SUNBURST	SC	BL
BOX SOLVES STORY PROBLEMS	SVE	MA	NU
BUILDING PERSPECTIVE	SUNBURST	MA	GM
BUILDING PERSPECTIVE	SUNBURST	PS	
BUMBLE GAMES	TLC	MA	GM
BUMBLE GAMES	TLC	PS	
BUMBLE PLOT	TLC	MA	GM
BUMBLE PLOT	TLC	PS	
CACTUSPLOT: A MATHEMATICS UTILITY	CACTUSPLOT	MA	AL
CALCULUS	BRODERBUND	MA	AD
CALENDAR CRAFTER	MECC	IT	GG
CALLIOPE	INNOVISION	IT	WP
CALLIOPE	INNOVISION	PS	
CARDIOVASCULAR FITNESS LAB	HRM SOFTWR	SC	BL
CARDIOVASCULAR FITNESS LAB	HRM SOFTWR	SC	SM
CATGEN	CONDUIT	SC	BL
CELL FUNCTIONS: GROWTH AND MITOSIS	IBM	SC	BL
CERTIFICATE MAKER	SPRINGBOARD	AT	
CERTIFICATE MAKER	SPRINGBOARD	IT	IM
CHALLENGE MATH	SUNBURST	MA	NU
CHANGING EARTH, THE	DC HEATH	SC	ES
CHARIOTS, COUGARS, AND KINGS	HARTLEY	LA	
CHEM LAB SIMULATIONS 1	HIGH TECH	SC	CH
CHEM LAB SIMULATIONS 2	HIGH TECH	SC	CH
CHEMICALS OF LIFE I: STRUCTURE	IBM	SC	CH
CIRCUIT LAB	MARK DAVIDS	SC	PH
CIRCULATION AND DIGESTION	MILLIKEN	SC	BL
CIRCUS MATH	MECC	MA	NU
CLASSIFICATION OF LIVING THINGS	ED'L ACTV	SC	BL
CLASSIFYING ANIMALS WITH BACKBONES	DC HEATH	SC	BL
CLIP ART COLLECTION V.1	SPRINGBOARD	IT	GG
CLIP ART COLLECTION V.1	SPRINGBOARD	IT	IM
CLIP ART COLLECTION V.2	SPRINGBOARD	IT	GG

ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
CLIP ART COLLECTION V.2	SPRINGBOARD	IT	IM
CLOCK	HARTLEY	MA	GM
CLOCK WORKS	MECC	MA	GM
CODE QUEST	SUNBURST	PS	
COLOR ME: COMPUTER COLORING KIT	MINDSCAPE	AT	
COLOR ME: COMPUTER COLORING KIT	MINDSCAPE	IT	GG
COLORTROPE	HRM SOFTWR	SC	SM
COMBINING THE ELEMENTS	DC HEATH	SC	CH
COMBINING THE ELEMENTS	DC HEATH	SC	GS
COMMODORE LOGO	COMMODORE	CS	
COMPARISON KITCHEN	DLM	LA	
COMPARISON KITCHEN	DLM	PR	
COMPARISON KITCHEN	DLM	PS	
COMPUTER CROSSROADS	ED'L ACTV	LA	
COMPUTER PREPARATION FOR THE SAT	HBJ	TE	
CONCEPTOR	MENTOR LRN	PS	
CONCERTWARE+	GREAT WAVE	MU	
CONQUERING WHOLE NUMBERS	MECC	MA	NU
COUNTERS	SUNBURST	PR	
COUNTING CRITTERS	MECC	MA	NU
COUNTING CRITTERS	MECC	PR	
CREATE WITH GARFIELD	DLM	AT	
CREATE WITH GARFIELD	DLM	IT	GG
CREATE WITH GARFIELD	DLM	LA	
CREATE-A-BASE	MECC	CS	
CREATE-A-BASE	MECC	IT	DB
CREATIVITY UNLIMITED	SUNBURST	AT	
CREATIVITY UNLIMITED	SUNBURST	MA	GM
CREATIVITY UNLIMITED	SUNBURST	PS	
CRICKET DRAW	CRICKET SW	AT	
CRICKET DRAW	CRICKET SW	IT	GG
CRICKET DRAW	CRICKET SW	IT	IM
CRICKET GRAPH	CRICKET SW	IT	GG
CRICKET GRAPH	CRICKET SW	IT	IM
CROSSCOUNTRY CALIFORNIA	DIDATECH	SS	GE
CROSSCOUNTRY CANADA	DIDATECH	PS	
CROSSCOUNTRY CANADA	DIDATECH	SS	GE
CROSSCOUNTRY TEXAS	DIDATECH	SS	GE
CROSSCOUNTRY USA	DIDATECH	PS	
CROSSCOUNTRY USA	DIDATECH	SS	GE
CROSSCOUNTRY USA	DIDATECH	SS	HI
CROSSWORD MAGIC	MINDSCAPE	IT	IM
CROSSWORD MAGIC	MINDSCAPE	LA	
CSL MARKS	CHANCERY SOF	IT	CM
CUBE BUILDER	HRM SOFTWR	MA	GM
CUBE BUILDER	HRM SOFTWR	PS	
DASHER	CONDUIT	WL	LT
DATAQUEST: COMPOSER	MECC	CS	
DATAQUEST: COMPOSER	MECC	IT	DB
DATAQUEST: SAMPLER	MECC	CS	
DATAQUEST: THE FIFTY STATES	MECC	SS	GE
DATAQUEST: THE PRESIDENTS	MECC	SS	GO
DAZZLE DRAW	BRODERBUND	AT	
DBASE	ASHTON TATE	IT	DB

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ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
DECIMAL DISCOVERY	DLM	MA	NU
DECISIONS, DECISIONS SERIES	TOM SNYDER	PS	
DECISIONS, DECISIONS: BUDGET PROCESS	TOM SNYDER	SS	GO
DECISIONS, DECISIONS: COLONIZATION	TOM SNYDER	SS	HI
DECISIONS, DECISIONS: FOREIGN POLICY	TOM SNYDER	SS	GO
DECISIONS, DECISIONS: IMMIGRATION	TOM SNYDER	SS	HI
DECISIONS, DECISIONS: REVOLUT. WAR	TOM SNYDER	SS	HI
DECISIONS, DECISIONS: TELEVISION	TOM SNYDER	SS	SO
DECISIONS, DECISIONS: URBANIZATION	TOM SNYDER	SS	SO
DELTA DRAWING	SPINNAKER	AT	
DELTA DRAWING	SPINNAKER	IT	GG
DINOSAUR DAYS	TYC	SC	BL
DINOSAUR DIG	MINDSCAPE	SC	BL
DINOSAUR DIG	MINDSCAPE	SC	GS
DINOSAURS	ADV ID	PR	
DINOSAURS AND SQUIDS	SCOTT FORS	MA	ST
DINOSAURS AND SQUIDS	SCOTT FORS	PS	
DISCOVERY LAB	MECC	PS	
DISCOVERY LAB	MECC	SC	GS
DISCOVERY LAB	MECC	SC	SM
DISCOVERY: EXPERIENCES W/SCI REASON	MILLIKEN	PS	
DISCOVERY: EXPERIENCES W/SCI REASON	MILLIKEN	SC	GS
DISCOVERY: EXPERIENCES W/SCI REASON	MILLIKEN	SC	SM
DISCRIMINATION ATTRIBUTES AND RULES	SUNBURST	PS	
DISNEY DESIGN STUDIO	SUNBURST	AT	
DOREMI	TEMPORAL	MU	
DRAW-IT	PAPERBACK	AT	
EARLY ADDITION	MECC	MA	NU
EARLY GAMES FOR YOUNG CHILDREN	SPRINGBOARD	PR	
EARLY GAMES MATCHMAKER	SPRINGBOARD	PR	
EARTHQUAKES	IBM	SC	ES
EASY GRAPH	GROLIER	IT	GG
EASY GRAPH II	GROLIER	MA	ST
EDUCALC	GROLIER	IT	SD
EDUCALC	GROLIER	MA	AL
EDUCALC	GROLIER	MA	NU
EDUCALC TEMPLATES	GROLIER	MA	AL
EDUCALC TEMPLATES	GROLIER	MA	NU
EJERCICIOS DE MATEMATICAS	MECC	WL	SP
EL ASISTENTE DEL INSTRUCTOR	MECC	WL	SP
EL MUNDO HISPANICO	DC HEATH	WL	SP
ELECTRIC POET	IBM	AT	
ELECTRIC POET	IBM	IT	AU
ELECTRIC WRITING	CREATIVE PUB	LA	
ELECTRONIC MAILBAG	EXSYM	IT	TC
ELECTRONIC MONEY	MECC	BE	EN
ELECTRONIC MONEY	MECC	SS	EC
ELECTRONIC VILLAGE	EXSYM	IT	TC
ELLEN NELSON MATH 1	DECISION	MA	NU
EN VACANCES	DC HEATH	WL	FR
EN VILLE	DC HEATH	WL	FR
ENCHANTED FOREST, THE	SUNBURST	MA	GM
ENCHANTED FOREST, THE	SUNBURST	PS	
ENGLISH ACHIEVEMENT I-V	MINDSCAPE	LA	

ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
ENVIRONMENT 1: HABITATS/ECOSYSTEMS	IBM	SC	EE
ENZYME INVESTIGATIONS	HRM SOFTWR	SC	CH
EQUATIONS I	MINDSCAPE	MA	AL
EQUATIONS II	MINDSCAPE	MA	AL
ERNIE'S MAGIC SHAPES	MINDSCAPE	PR	
EXCEL	MICROSOFT	IT	SD
EXPERIMENTS IN CHEMISTRY	HRM SOFTWR	SC	CH
EXPERIMENTS IN COLORIMETRY	HRM SOFTWR	SC	CH
EXPERIMENTS IN HUMAN PHYSIOLOGY	HRM SOFTWR	SC	BL
EXPERIMENTS IN SCIENCE	HRM SOFTWR	SC	BL
EXPERIMENTS IN SCIENCE	HRM SOFTWR	SC	CH
EXPERIMENTS IN SCIENCE	HRM SOFTWR	SC	ES
EXPERIMENTS IN SCIENCE	HRM SOFTWR	SC	PH
EXPLORE-A-SCIENCE: TYRANNOSAURUS	DC HEATH	SC	BL
EXPLORE-A-STORY SERIES	DC HEATH	LA	
EXPLORER METROS	SUNBURST	MA	GM
EXPLORING TABLES AND GRAPHS I	OPTIMUM RES	MA	AL
EXPLORING TABLES AND GRAPHS I	OPTIMUM RES	MA	ST
EXPLORING TABLES AND GRAPHS II	OPTIMUM RES	MA	AL
EXPLORING TABLES AND GRAPHS II	OPTIMUM RES	MA	ST
EXPRESSION WRITER	HRM SOFTWR	MA	AL
EXPRESSION WRITER	HRM SOFTWR	MA	NU
EXPRESSIONIST	ALLEN BONADI	MA	AD
EXPRESSIONIST	ALLEN BONADI	MA	AL
EZ LOGO	MECC	CS	
EZ LOGO	MECC	PS	
FACEMAKER	SPINNAKER	AT	
FACTORING ALGEBRAIC EXPRESSIONS	MINDSCAPE	MA	AL
FACTORY, THE	SUNBURST	MA	GM
FACTORY, THE	SUNBURST	PS	
FACTORY, THE	SUNBURST	SS	EC
FANTAVISION	BRODERBUND	AT	
FANTAVISION	BRODERBUND	IT	GG
FAST TRACK FRACTIONS	DLM	MA	NU
FAY'S WORD RALLY	DIDATECH	LA	
FILEMAKER	NASHOBA	IT	DB
FIRST CHOICE	MEIZNER	IT	WP
FIRST DRAFT	SCHOLASTIC	IT	WP
FIRST DRAFT	SCHOLASTIC	LA	
FIRST R	MILLIKEN	PR	
FIRST-LETTER FUN	MECC	LA	
FIRST-LETTER FUN	MECC	PR	
FISH SCALES	DLM	MA	GM
FISH SCALES	DLM	PR	
FLYING CARPET, THE	LRNG TECH	PS	
FOR YOUR NEXT ADVENTURE	SUNBURST	CS	
FORECAST	MINDSCAPE	SC	ES
FRACTION CONCEPTS, INC.	MECC	MA	NU
FRACTION MUNCHERS	MECC	MA	NU
FRACTION PRACTICE UNLIMITED	MECC	MA	NU
FRACTIONS: ADDITION AND SUBTRACTION	HOUGHTON	MA	NU
FRACTIONS: BASIC SKILLS	HOUGHTON	MA	NU
FREDWRITER	SOFTSWAP	IT	WP
FREDWRITER	SOFTSWAP	LA	

ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
FREQUENCY METER	VERNIER	SC	SM
FRIENDLY COMPUTER, THE	MECC	CS	
FRIENDLY FILER	GROLIER	CS	
FRIENDLY FILER	GROLIER	IT	DB
FULLPAINT	ASHTON TATE	AT	
FUN FROM A TO Z	MECC	LA	
FUN FROM A TO Z	MECC	PR	
FUN HOUSE MAZE	SUNBURST	PS	
GAME SHOW, THE	ADV ID	PS	
GAMEFRAME: ONE AND TWO	HOUGHTON	MA	NU
GEARS	SUNBURST	MA	NU
GEARS	SUNBURST	PS	
GENETICS	MECC	SC	BL
GEOMETRIC PRESUPPOSER	SUNBURST	MA	GM
GEOMETRIC SUPPOSER: CIRCLES	SUNBURST	MA	GM
GEOMETRIC SUPPOSER: QUADRILATERALS	SUNBURST	MA	GM
GEOMETRIC SUPPOSER: TRIANGLES	SUNBURST	MA	GM
GEOMETRY	BRODERBUND	MA	GM
GEOMETRY ALIVE!	ED'L ACTV	MA	GM
GEOWORLD	TOM SNYDER	PS	
GEOWORLD	TOM SNYDER	SS	EC
GEOWORLD	TOM SNYDER	SS	GE
GERTRUDE'S PUZZLES	TLC	PR	
GERTRUDE'S PUZZLES	TLC	PS	
GERTRUDE'S SECRETS	TLC	PR	
GERTRUDE'S SECRETS	TLC	PS	
GETTING READY TO READ AND ADD	SUNBURST	LA	
GETTING READY TO READ AND ADD	SUNBURST	PR	
GHOST WRITER	MECC	IT	WP
GHOST WRITER	MECC	LA	
GLIDEPATH	HRM SOFTWR	SC	PH
GLIDEPATH	HRM SOFTWR	VE	
GNEE OR NOT GNEE	SUNBURST	PS	
GOLDEN SPIKE, THE	NATIONAL GEO	SS	HI
GPLE: GLOBAL PROGRAM LINE EDITOR	BEAGLE BRO	CS	
GRAMMAR GREMLINS	DAVIDSON	LA	
GRAPHICAL ANALYSIS III	VERNIER	MA	AD
GRAPHICAL ANALYSIS III	VERNIER	SC	SM
GRAPHICS EXPANDER V.1	SPRINGBOARD	AT	
GRAPHICWORKS	MINDSCAPE	AT	
GRAPHICWORKS	MINDSCAPE	IT	GG
GRAPHING EQUATIONS	CONDUIT	MA	AL
GREEN GLOBS AND GRAPHING EQUATIONS	SUNBURST	MA	AL
GROUND WATER	IBM	SC	ES
GUIDE DE L'ENSEIGNANT	MECC	WL	FR
GUTENBERG	GESSLER	WL	LT
HARMONIOUS DICTATOR	TEMPORAL	MU	
HEALTH AWARENESS GAMES	HRM SOFTWR	HL	
HEART ABNORMALITIES AND EKGs	FOCUS	HL	
HEART ABNORMALITIES AND EKGs	FOCUS	SC	BL
HEAT AND TEMPERATURE	HRM SOFTWR	SC	GS
HEAT AND TEMPERATURE	HRM SOFTWR	SC	SM
HEAT ENERGY	DC HEATH	SC	ES
HEATH SCIENCE: EXPLORING HEAT	DC HEATH	SC	GS

ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
HEATH SCIENCE: EXPLORING MATTER	DC HEATH	SC	GS
HIDE 'N SEQUENCE	SUNBURST	PS	
HIGH WIRE LOGIC	SUNBURST	PS	
HINKY PINKY GAME	MINDSCAPE	LA	
HOMETOWN: LOCAL AREA STUDY	ACTIVE LEARN	CS	
HOMETOWN: LOCAL AREA STUDY	ACTIVE LEARN	PS	
HOMETOWN: LOCAL AREA STUDY	ACTIVE LEARN	SS	HI
HOMEWORKER	DAVIDSON	IT	SA
HOT DOG STAND	SUNBURST	PS	
HOT DOG STAND	SUNBURST	SS	EC
HOW CAN I FIND IT?	SUNBURST	LM	
HOW THE WEST WAS ONE + THREE x FOUR	SUNBURST	MA	NU
HOW TO BUILD A BETTER MOUSETRAP	VERNIER	SC	SM
HUMAN GENETIC DISORDERS	HRM SOFTWR	SC	BL
HYDROLOGIC CYCLE	IBM	SC	ES
HYPERCARD	APPLE	IT	AU
HYPERCARD	APPLE	IT	DB
HYPERCARD	APPLE	IT	GG
I CAN WRITE!	SUNBURST	LA	
IBM LOGO	IBM	CS	
IGGY'S GNEES	SUNBURST	PS	
II WRITE	RANDOM	IT	WP
IMMIGRANT	ETC	SS	HI
INCREDIBLE LABORATORY, THE	SUNBURST	PS	
INCREDIBLE LABORATORY, THE	SUNBURST	SC	SM
INFORMATION CONNECTION	GROLIER	IT	TC
INFORMATION CONNECTION	GROLIER	LM	
INFORMATION LAB SOFTWARE/EARTH SC	ADD WES	SC	ES
INTEGRATED ACCOUNTING	BEDFORD SOFT	BE	AC
INTERPRETING GRAPHS	SUNBURST	MA	AL
INTRO TO GENERAL CHEMISTRY	COMPRESS	SC	CH
INVESTIGATING ACCELERATION	IBM	SC	PH
INVESTIGATING ELECTRIC FIELDS	IBM	SC	PH
INVESTIGATING GRAVITATIONAL FORCE	IBM	SC	PH
JACK AND THE BEANSTALK	HRM SOFTWR	LA	
JAM SESSION	BRODERBUND	MU	
JAZZ DICTATOR	TEMPORAL	MU	
JENNY'S JOURNEYS	MECC	PS	
JENNY'S JOURNEYS	MECC	SS	HI
JUEGOS COMUNICATIVOS	RANDOM	WL	SP
JUGGLES' RAINBOW	TLC	PR	
KAREL THE ROBOT	WILEY	CS	
KEYBOARD CADET	MINDSCAPE	KB	
KEYBOARDING MASTER	MECC	KB	
KEYBOARDING PRIMER	MECC	KB	
KINDERCOMP	SPINNAKER	PR	
KING'S RULE, THE	SUNBURST	MA	AL
KING'S RULE, THE	SUNBURST	MA	NU
KING'S RULE, THE	SUNBURST	PS	
KOALAPAINTER	PTI-KOALA	AT	
KOALAPAINTER	PTI-KOALA	IT	GG
KRELL LOGO	KRELL	CS	
LEARNING ABOUT NUMBERS	C & C SOFT	PR	
LEARNING THROUGH LOGO	SUNBURST	CS	

ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
LEARNING TO COPE WITH PRESSURE	SUNBURST	HL	
LEGO TC LOGO	LEGO	PS	
LES SPORTS	DC HEATH	WL	FR
LETTERS AND FIRST WORDS	C & C SOFT	LA	
LETTERS AND FIRST WORDS	C & C SOFT	PR	
LETTERS AND WORDS	MINDSCAPE	PR	
LIFE IN THE OCEAN	DC HEATH	SC	ES
LIFE IN THE OCEAN	DC HEATH	SC	GS
LIFE SCIENCE DATA BASE	SCHOLASTIC	SC	BL
LIGHT LAB	CREATIVE TEC	SC	PH
LIGHT LAB	CREATIVE TEC	SC	SM
LIGHT, PLANTS AND PHOTOSYNTHESIS	IBM	SC	BL
LINCOLN'S DECISIONS	ED'L ACTV	SS	HI
LISTEN TO LEARN	IBM	LA	
LOGIC BUILDERS	SCHOLASTIC	PS	
LOGOWORKS	TERRAPIN	CS	
LOGOWRITER	LCSI	CS	
LOGOWRITER	LCSI	LA	
LOGOWRITER	LCSI	PS	
LOTUS 1-2-3	LOTUS	IT	DB
LOTUS 1-2-3	LOTUS	IT	SD
LOTUS 1-2-3	LOTUS	IT	WP
M-SS-NG L-NKS: CLASSICS	SUNBURST	LA	
M-SS-NG L-NKS: ENGLISH EDITOR	SUNBURST	LA	
M-SS-NG L-NKS: LE MOT JUSTE	SUNBURST	WL	FR
M-SS-NG L-NKS: MICRO ENCYCLOPEDIA	SUNBURST	LA	
M-SS-NG L-NKS: WORTSPIEL	SUNBURST	WL	GR
M-SS-NG L-NKS: YOUNG PEOPLE'S LIT	SUNBURST	LA	
MAC 3D	CHALLENGER	AT	
MAC ART DEPARTMENT	SIMON & SCHU	IT	GG
MAC PROOF	A.L.P.S.	IT	WP
MACDRAW	CLARIS	AT	
MACHINES AND FORCE	DC HEATH	SC	GS
MACPAINT	CLARIS	AT	
MACPAINT	CLARIS	IT	GG
MACTERMINAL	CLARIS	IT	TC
MACVISION	PTI-KOALA	AT	
MACWRITE	CLARIS	IT	WP
MAGIC PIANO	EDUSOFT	MU	
MAGIC SLATE	SUNBURST	IT	WP
MAGIC SLATE	SUNBURST	LA	
MARKET PLACE, THE	MECC	BE	EN
MARKET PLACE, THE	MECC	MA	NU
MARKET PLACE, THE	MECC	SS	EC
MASTER SPELL	MECC	LA	
MASTERING MATH SERIES	MECC	MA	NU
MASTERING THE ACT	MINDSCAPE	TE	
MASTERTYPE	MINDSCAPE	KB	
MASTERTYPE'S FILER	MINDSCAPE	IT	DB
MATH ACTIVITIES COURSEWARE LV.1-8	HOUGHTON	MA	NU
MATH PRACTICE LV.I	IBM	MA	NU
MATH RABBIT	TLC	MA	NU
MATH SEQUENCES, REVISED	MILLIKEN	MA	AL
MATH SEQUENCES, REVISED	MILLIKEN	MA	NU

ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
MATH SHOP, THE	SCHOLASTIC	MA	NU
MATH WORD PROBLEMS	OPTIMUM RES	MA	NU
MATH WORLDS: SAMPLING	DC HEATH	MA	ST
MATH WORLDS: STRATEGIES I AND II	DC HEATH	MA	NU
MATH: SOLVING STORY PROBLEMS LV.3-8	HOUGHTON	MA	NU
MATHGRAPHER	HRM SOFTWR	MA	AL
MATHTYPE	DESIGN SCI	MA	AD
MECC GRAPH	MECC	IT	GG
MECC GRAPH	MECC	MA	ST
MECC GRAPHING PRIMER	MECC	IT	GG
MECC GRAPHING PRIMER	MECC	MA	ST
MECC SPELLER	MECC	IT	SK
MECC WRITE START	MECC	LA	
MECC WRITER	MECC	IT	WP
MELODIOUS DICTATOR	TEMPORAL	MU	
MEMORY CASTLE	SUNBURST	PS	
MEMORY: A FIRST STEP	SUNBURST	PS	
MENDELIAN GENETICS	IBM	SC	BL
METEOR MISSION	DLM	MA	NU
METEOR MULTIPLICATION	DLM	MA	NU
MICRO GARDENER	ED'L ACTV	SC	BL
MICRO GARDENER	ED'L ACTV	SC	ES
MICROSOFT MU-MATH	MICROSOFT	MA	AD
MICROSOFT MU-MATH	MICROSOFT	MA	AL
MICROSOFT WORD	MICROSOFT	IT	WP
MICROSOFT WORKS	MICROSOFT	IT	DB
MICROSOFT WORKS	MICROSOFT	IT	SD
MICROSOFT WORKS	MICROSOFT	IT	TC
MICROSOFT WORKS	MICROSOFT	IT	WP
MICROTYPE: WONDERFUL WORLD OF PAWS	SW PUB	KB	
MICROZINE SUBSCRIPTION	SCHOLASTIC	EP	
MILLIKEN WORD PROCESSOR	MILLIKEN	IT	WP
MIND PUZZLES	MECC	PS	
MINDSTRETCHER SERIES	ISL SOFTWR	PS	
MIRRORS ON THE MIND-STATISTICS	ADD WES	MA	ST
MIRRORS ON THE MIND-STRATEGIES	ADD WES	MA	ST
MOLEC: MOLECULAR MODELING	COMPRESS	SC	CH
MONEY AND TIME ADVENTURES LOLLIPOP	SVE	MA	GM
MONEY AND TIME ADVENTURES LOLLIPOP	SVE	MA	NU
MONEY WORKS	MECC	MA	NU
MONEY! MONEY!	HARTLEY	MA	NU
MOPTOWN HOTEL	TLC	PR	
MOPTOWN HOTEL	TLC	PS	
MOPTOWN PARADE	TLC	PR	
MOPTOWN PARADE	TLC	PS	
MORE	LIV TEXT	IT	WP
MOTION	HRM SOFTWR	SC	PH
MOUSE PAINT	CLARIS	IT	GG
MOVING MOLECULES	HRM SOFTWR	SC	CH
MOVING MOLECULES	HRM SOFTWR	SC	PH
MR. PIXEL'S CARTOON KIT	MINDSCAPE	AT	
MR. PIXEL'S PROGRAMMING PAINT SET	MINDSCAPE	AT	
MULTIPLICATION PUZZLES	MECC	MA	NU

ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
MULTISCRIBE	SCHOLASTIC	IT	WP
MULTISCRIBE GS	SCHOLASTIC	IT	WP
MUPPET SLATE	SUNBURST	PR	
MUPPET WORD BOOK THE	SUNBURST	PR	
MUPPET WORD BOOK, THE	SUNBURST	LA	
MUPPETS ON STAGE	SUNBURST	PR	
MUPPETVILLE	SUNBURST	LA	
MUPPETVILLE	SUNBURST	PR	
MUSIC CONSTRUCTION SET	ELECTR ART	MU	
MUSIC DETECTIVE, THE	TEMPORAL	MU	
MUSIC FUNDAMENTALS I	SILVER	MU	
MUSIC SHOP	BRODERBUND	MU	
MUSIC STUDIO	MEDIAGENIC	MU	
MUSIC THEORY	MECC	MU	
MUSICWORKS	SPINNAKER	MU	
NEWBERY ADVENTURE: CHARLOTTE'S WEB	SUNBURST	LA	
NEWBERY ADVENTURE: WRINKLE IN TIME	SUNBURST	LA	
NEWSQUEST	TIME	EP	
NEWSROOM	SCHOLASTIC	AT	
NEWSROOM	SPRINGBOARD	IT	IM
NEWSROOM CLIP ART V.1	SCHOLASTIC	AT	
NEWSROOM PRO	SPRINGBOARD	IT	IM
NEWSWORKS	NEWSWEEK	SS	GO
NOW HEAR THIS	MARSHWARE	HL	
NOW HEAR THIS	MARSHWARE	SC	BL
NUMBER FARM	DLM	MA	NU
NUMBER FARM	DLM	PR	
NUMBER MUNCHERS	MECC	MA	NU
NUMBER SEA HUNT	GAMCO	MA	NU
ODELL LAKE	MECC	PS	
ODELL LAKE	MECC	SC	GS
OH, DEER!	MECC	PS	
OH, DEER!	MECC	SC	EE
ONE WORLD: COUNTRIES DATA BASE	ACTIVE LEARN	SS	GE
OPTICS ON COMPUTER: PHYSICAL SCIENCE	FOCUS	SC	PH
OREGON TRAIL, THE	MECC	PS	
OREGON TRAIL, THE	MECC	SS	HI
OTHER SIDE, THE	TOM SNYDER	PS	
OTHER SIDE, THE	TOM SNYDER	SS	EC
OTHER SIDE, THE	TOM SNYDER	SS	GO
OUR TOWN MEETING	TOM SNYDER	SS	GO
PAGEMAKER	ALDUS	AT	
PAGEMAKER	ALDUS	IT	IM
PAINT WITH WORDS	MECC	LA	
PAINT WITH WORDS	MECC	PR	
PAINTWORKS PLUS	MEDIAGENIC	AT	
PAINTWORKS PLUS	MEDIAGENIC	IT	GG
PARIS EN METRO	DC HEATH	WL	FR
PATHFINDER	SUNBURST	MA	GM
PATHOLOGY: DISEASES AND DEFENSES	IBM	SC	BL
PATTERNMAKER	MINDSCAPE	AT	
PC STORYBOARD	IBM	IT	IM
PERIODIC TABLE: COMPUTER ASSISTED	COMPRESS	SC	CH
PERPLEXING PUZZLES	HARTLEY	LA	

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ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
PFS: GRAPH	SCHOLASTIC	IT	GG
PFS: WRITE	SCHOLASTIC	IT	WP
PHONICS PRIME TIME: BLENDS AND DIGRA.	MECC	LA	
PHONICS PRIME TIME: FINAL CONSONANTS	MECC	LA	
PHONICS PRIME TIME: INITIAL CONSONANTS	MECC	LA	
PHONICS PRIME TIME: VOWELS I	MECC	LA	
PHONICS PRIME TIME: VOWELS II	MECC	LA	
PHYSICAL SCIENCE DATA BASE	SCHOLASTIC	SC	CH
PHYSICAL SCIENCE DATA BASE	SCHOLASTIC	SC	GS
PIC-BUILDER	OPTIMUM RES	AT	
PICTURE PERFECT	MINDPLAY	AT	
PIECE OF CAKE MATH	SPRINGBOARD	MA	NU
PINBALL CONSTRUCTION SET	ELECTR ART	PS	
PLANE VIEW	SUNBURST	MA	GM
PLANETARY CONSTRUCTION SET	SUNBURST	PS	
PLANETARY CONSTRUCTION SET	SUNBURST	SC	AY
PLAYWRITER'S THEATER	ED TECH	LA	
PLAYWRITER: SERIES	GROLIER	LA	
POETRY EXPRESS	MINDSCAPE	LA	
POLYWRITER	PASSPORT	MU	
POND, THE	SUNBURST	MA	NU
POND, THE	SUNBURST	PS	
POWER POINT	MICROSOFT	IT	IM
PRACTICAL THEORY	ALFRED MUSIC	MU	
PRIMARY WORDMATH	MILLIKEN	MA	NU
PRINCIPAL'S ASSISTANT	MINDSCAPE	IT	GG
PRINT MAGIC	EPYX	IT	GG
PRINT SHOP	BRODERBUND	AT	
PRINT SHOP	BRODERBUND	IT	GG
PRINT SHOP COMPANION	BRODERBUND	AT	
PRINT SHOP GRAPHICS IIGS LIBRARY	BRODERBUND	IT	GG
PRINT SHOP GRAPHICS LIBRARY	BRODERBUND	AT	
PRINT SHOP GRAPHICS LIBRARY 3	BRODERBUND	AT	
PROBLEM SOLVING COMPUTER CW LV.5-8	MCGRAW HILL	MA	NU
PROBLEM SOLVING COMPUTER CW LV.K-4	MCGRAW HILL	MA	NU
PROBLEM-SOLVING STRATEGIES	MECC	PS	
PROFESSION: DETECTIVE	GESSLER	WL	FR
PROFESSIONAL SIGN MAKER	SUNBURST	IT	GG
PROFESSIONAL SIGN MAKER	SUNBURST	IT	IM
PROJECT ZOO	NATIONAL GEO	MA	ST
PROJECT ZOO	NATIONAL GEO	SC	GS
PSYCH LAB	HRM SOFTWR	SC	GS
PUZZLE MASTER	SHENANDOAH	IT	IM
PUZZLE TANKS	SUNBURST	MA	NU
PUZZLE TANKS	SUNBURST	PS	
PUZZLER	SUNBURST	LA	
PUZZLES AND POSTERS	MECC	IT	IM
QUATIONS	SCHOLASTIC	MA	AL
QUATIONS	SCHOLASTIC	PS	
QUICKFLASH	MECC	IT	IM
QUOTIENT QUEST	MECC	MA	NU
READER RABBIT	TLC	LA	
READING FOR INFORMATION LV. II-IV	IBM	LA	

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Title	Publisher	Subjects	Topics
READING FOR MEANING LV. I-IV	IBM	LA	
READING WORKSHOP, THE	MINDSCAPE	LA	
READY, SET, GO	LETRASET USA	IT	GG
RED RYDER	FREESOFT	IT	TC
REGROUPING	SUNBURST	PS	
RIGHT TURN, THE	SUNBURST	MA	GM
RIPPLE THAT CHANGED AMERICAN HISTORY	TOM SNYDER	SS	HI
ROBOT ODYSSEY	TLC	PS	
ROCKY'S BOOTS	TLC	PS	
ROYAL RULES	SUNBURST	MA	AL
ROYAL RULES	SUNBURST	MA	NU
ROYAL RULES	SUNBURST	PS	
SAFARI SEARCH	SUNBURST	PS	
SAILING THROUGH STORY PROBLEMS	DLM	MA	NU
SALINA MATH GAMES	ED'L ACTV	MA	NU
SCHOLASTIC'S PFS: FILE AND REPORT	SCHOLASTIC	CS	
SCHOLASTIC'S PFS: FILE AND REPORT	SCHOLASTIC	IT	DB
SCIENCE #1: THE ENVIRONMENT	DECISION	SC	EE
SCIENCE TOOL KIT 1: SPEED/MOTION	BRODERBUND	SC	GS
SCIENCE TOOL KIT 1: SPEED/MOTION	BRODERBUND	SC	PH
SCIENCE TOOL KIT 1: SPEED/MOTION	BRODERBUND	SC	SM
SCIENCE TOOL KIT 2: EARTHQUAKE	BRODERBUND	SC	ES
SCIENCE TOOL KIT MASTER MODULE	BRODERBUND	SC	GS
SCIENCE TOOL KIT MASTER MODULE	BRODERBUND	SC	PH
SCIENCE TOOL KIT MASTER MODULE	BRODERBUND	SC	SM
SEE THE U.S.A.	COMPU-TEACH	SS	GE
SEMCALC	SUNBURST	MA	AD
SEMCALC	SUNBURST	MA	AL
SEMCALC	SUNBURST	MA	NU
SEMCALC	SUNBURST	PS	
SENSIBLE GRAMMAR	SENSIBLE	IT	WP
SHAPE AND COLOR RODEO	DLM	PR	
SHOW TIME	MECC	LA	
SIMPLE MACHINES	MICRO P&L	SC	GS
SIMPLE MACHINES	MICRO P&L	SC	PH
SIR WILLIAM WRONG-NOTE	TEMPORAL	MU	
SKY LAB	MECC	SC	AY
SKY TRAVEL	COMMODORE	SC	AY
SMARTCOM II	HAYES	IT	TC
SMELL & TELL	MARSHWARE	SC	GS
SMOKING DECISION	SUNBURST	HL	
SOCMATE	AGS	LA	
SOLAR FOOD: EXPLAN. PHOTOSYNTHESIS	HRM SOFTWR	SC	BL
SONGWRITER	MINDSCAPE	MU	
SOUND IDEAS SERIES	HOUGHTON	LA	
SOUND TRACKS	MECC	MU	
SOUND TRACKS	MECC	PS	
SOUND: A MICROCOMPUTER-BASED LAB	HRM SOFTWR	SC	PH
SOUTH DAKOTA	ED'L ACTV	MA	NU
SPACE SUBTRACTION	MECC	MA	NU
SPANISH FREDWRITER	ED'L ACTV	WL	SP
SPECTRUM: PATTERNS AND PROGRAMS	SUNBURST	CS	
SPEEDWAY MATH	MECC	MA	NU

ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
SPINNERS AND SLUGS	SCOTT FORS	MA	ST
STATES AND CAPITALS	GAMCO	SS	GE
STICKYBEAR ABC	OPTIMUM RES	LA	
STICKYBEAR ABC	OPTIMUM RES	PR	
STICKYBEAR DRAWING	OPTIMUM RES	AT	
STICKYBEAR MATH 1	OPTIMUM RES	MA	NU
STICKYBEAR MATH 2	OPTIMUM RES	MA	NU
STICKYBEAR NUMBERS	OPTIMUM RES	PR	
STICKYBEAR OPPOSITES	OPTIMUM RES	PR	
STICKYBEAR OPPOSITES	OPTIMUM RES	PS	
STICKYBEAR SHAPES	OPTIMUM RES	PR	
STICKYBEAR SHAPES	OPTIMUM RES	PS	
STICKYBEAR TOWN BUILDER	OPTIMUM RES	PS	
STICKYBEAR TOWN BUILDER	OPTIMUM RES	SS	SO
STICKYBEAR TYPING	OPTIMUM RES	KB	
STICKYBEAR WORD PROBLEMS	OPTIMUM RES	MA	NU
STORY TREE	SCHOLASTIC	PS	
STUDENT STORIES	MECC	LA	
STUFF AND FETCH	MECC	CS	
SUCCESS WITH TYPING	SCHOLASTIC	KB	
SUPER FACTORY, THE	SUNBURST	MA	GM
SUPER FACTORY, THE	SUNBURST	PS	
SUPER SCOOP II	COMPRESS	LA	
SUPERPAINT	SILICON BEAC	AT	
SUPERPAINT	SILICON BEAC	IT	GG
SUPERPLOT	EDUSOFT	MA	AD
SUPERPLOT	EDUSOFT	MA	AL
SUPERPRINT	SCHOLASTIC	AT	
SUPERPRINT	SCHOLASTIC	IT	GG
SURVEY TAKER	SCHOLASTIC	CS	
SURVEY TAKER	SCHOLASTIC	IT	DB
SURVEY TAKER	SCHOLASTIC	SS	SO
SURVIVAL MATH	SUNBURST	MA	NU
SWEET SHOPPE	DC HEATH	MA	NU
TAKE 1: ANIMATION GRAPHICS	BAUDVILLE	AT	
TAKE 1: ANIMATION GRAPHICS	BAUDVILLE	IT	GG
TALKING TEXT WRITER	SCHOLASTIC	LA	
TEASERS BY TOBBS	SUNBURST	MA	NU
TEASERS BY TOBBS	SUNBURST	PS	
TECMATH--DIFFERENTIATION	TECH ED	MA	AD
TECMATH--INTEGRATION	TECH ED	MA	AD
TEDDY'S PLAYGROUND	SUNBURST	MA	GM
TEDDY'S PLAYGROUND	SUNBURST	PR	
TEDDY'S PLAYGROUND	SUNBURST	PS	
TELLING TIME	GAMCO	MA	GM
TEMPERATURE EXPERIMENTS	HARTLEY	SC	PH
TEMPERATURE EXPERIMENTS	HARTLEY	SC	SM
TEN CLUES	SUNBURST	PS	
TERRAPIN LOGO	TERRAPIN	CS	
THINK QUICK	TLC	PS	
THOSE AMAZING READING MACHINES I-V	MECC	LA	
TIC TAC SHOW	ADV ID	PS	
TICKET TO PARIS	BLUE LION	WL	FR
TICKET TO SPAIN	BLUE LION	WL	SP

ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
TIME EXPLORERS	GAMCO	MA	GM
TIME TUNNEL	FOCUS	SS	HI
TIMELINER	TOM SNYDER	IT	IM
TIMELINER	TOM SNYDER	SS	HI
TIP 'N FLIP	SUNBURST	PS	
TO PRESERVE, PROTECT, AND DEFEND	MECC	SS	GO
TOBBS LEARNS ALGEBRA	SUNBURST	MA	AL
TONEY LISTENS TO MUSIC	TEMPORAL	MU	
TONK IN THE LAND OF BUDDY-BOTS	MINDSCAPE	PS	
TOP DRAW	STYLEWARE	AT	
TOP DRAW	STYLEWARE	IT	GG
TOUCHY SUBJECT	MARSHWARE	SC	BL
TOY SHOP	BRODERBUND	AT	
TOY SHOP	BRODERBUND	VE	
TRADING POST	SUNBURST	PS	
TRIGONOMETRY OF THE RIGHT TRIANGLE	MINDSCAPE	MA	AD
TRIVIA MACHINE	MECC	CS	
TRIVIA MACHINE	MECC	LM	
TRIVIA MACHINE	MECC	PS	
TURBO PASCAL	BORLAND	CS	
TURBO PASCAL MAC	BORLAND	CS	
TURTLE TRACKS	SCHOLASTIC	CS	
TURTLE TRACKS	SCHOLASTIC	IT	GG
TYPE TO LEARN	SUNBURST	KB	
TYPE!	BRODERBUND	KB	
TYPING TUTOR IV	SIMON & SCHU	BE	TY
TYPING TUTOR IV	SIMON & SCHU	KB	
UN DIA EN MADRID	DC HEATH	WL	SP
UN DIA TIPICO	DC HEATH	WL	SP
UN REPAS FRANCAIS	DC HEATH	WL	FR
UN VIAJE EN TREN	DC HEATH	WL	SP
UNA FIESTA	DC HEATH	WL	SP
UNA VISITA A MEXICO	DC HEATH	WL	SP
UNDERSTANDING CHARTS AND GRAPHS	SVE	MA	ST
UNDERSTANDING WORD PROBLEMS	SVE	MA	NU
UNLOCKING THE MAP CODE	RAND MCNLY	SS	GE
US CONSTITUTION THEN AND NOW	SCHOLASTIC	SS	GO
US GOVERNMENT DATA BASE	SCHOLASTIC	SS	GO
US HISTORY DATA BASE	SCHOLASTIC	SS	HI
USA PROFILE	ACTIVE LEARN	SS	GE
USING A CALENDAR	HARTLEY	MA	GM
VIDEOWORKS II	BRODERBUND	AT	
VIDEOWORKS II	BRODERBUND	IT	GG
VOLCANOES	EARTHWARE	SC	ES
VOLCANOES	IBM	SC	ES
VOYAGE MIMI: ECOSYSTEMS	HOLT R&W	MA	NU
VOYAGE MIMI: ECOSYSTEMS	HOLT R&W	SC	EE
VOYAGE MIMI: INTRO TO COMPUTING	HOLT R&W	CS	
VOYAGE MIMI: ISLAND SURVIVORS	HOLT R&W	SC	EE
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VOYAGE MIMI: MAPS AND NAVIGATION	HOLT R&W	MA	GM
VOYAGE MIMI: MAPS AND NAVIGATION	HOLT R&W	SC	ES
VOYAGE MIMI: MAPS AND NAVIGATION	HOLT R&W	SC	GS
VOYAGE MIMI: WHALES AND	HOLT R&W	SC	SM

ALPHABETICAL LIST OF TITLES

Title	Publisher	Subjects	Topics
ENVIRONMENT			
WALLY'S WORD WORKS	SUNBURST	LA	
WALT DISNEY COMIC STRIP MAKER	SUNBURST	IT	GG
WALT DISNEY COMIC STRIP MAKER	SUNBURST	LA	
WEATHER AND CLIMATE LAB	SCHOLASTIC	SC	ES
WHAT'S MY LOGIC	MIDWESTPC	PS	
WHATSIT CORPORATION	SUNBURST	BE	EN
WHATSIT CORPORATION	SUNBURST	MA	NU
WHATSIT CORPORATION	SUNBURST	PS	
WHERE IN EUROPE IS CARMEN SANDIEGO?	BRODERBUND	SS	GE
WHERE IN USA IS CARMEN SANDIEGO?	BRODERBUND	PS	
WHERE IN USA IS CARMEN SANDIEGO?	BRODERBUND	SS	GE
WHERE IN WORLD IS CARMEN SANDIEGO?	BRODERBUND	LM	
WHERE IN WORLD IS CARMEN SANDIEGO?	BRODERBUND	PS	
WHERE IN WORLD IS CARMEN SANDIEGO?	BRODERBUND	SS	GE
WHO AM I?	FOCUS	SC	GS
WHOLE NUMBERS: ADD. AND SUBTRACTION	HOUGHTON	MA	NU
WHOLE NUMBERS: MULT. AND DIVISION	HOUGHTON	MA	NU
WINNIE THE POOH IN 100 ACRE WOOD	SUNBURST	LA	
WORD HERD: LOOK LIKES	MECC	LA	
WORD HERD: SOUND ALIKES	MECC	LA	
WORD MUNCHERS	MECC	LA	
WORD PERFECT	WORD PERFECT	IT	WP
WORD WIZARDS	MECC	LA	
WORD-A-MATION	SUNBURST	LA	
WORDMATH 1-2	MILLIKEN	MA	NU
WORDS AT WORK: CONTRACTION ACTION	MECC	LA	
WORKSHEET WIZARD I-III	EDUSOFT	MA	NU
WRITE ON! SERIES	HUMANITIES	LA	
WRITER RABBIT	TLC	LA	
WRITER'S HELPER II	CONDUIT	LA	
WRITING A CHARACTER SKETCH	MECC	LA	
WRITING A NARRATIVE	MECC	LA	
WRITING AN OPINION PAPER	MECC	LA	
WRITING WORKSHOP, THE	MILLIKEN	IT	WP
WRITING WORKSHOP, THE	MILLIKEN	LA	
YOU ARE WHAT YOU EAT	MARSHWARE	HL	
ZOYON PATROL	MECC	PS	

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Courseware Selection

by
Ann Lathrop
San Mateo County Office of Education

Reprinted from Computers in Composition Instruction, an ICCE publication.

Educators have a crucial role to play in today's rapidly expanding field of instructional software. It is our responsibility to become skilled evaluators who look critically at courseware *before* we purchase it for use in our classrooms. We must demand excellence and reject that which is mediocre. We must be willing to write critical reviews in our professional journals. Finally, we must persuade those journals that have not yet added computer courseware to their reviews of instructional materials to do so.

The technology that can be used to set new standards of courseware excellence now exists. Creative designers and programmers are developing courseware that taps the interactive power of the computer and truly involves the student in the learning process. Merely placing workbook pages on the screen and asking occasional multiple-choice questions is no longer enough. We are well past the stage of being pleased simply because a program will load and run correctly. As we locate highly creative, interactive programs, we must publicize them to our associates for their own use and identify them for the larger educational community as a new standard for instructional computing.

Approximately 8,000 programs are currently being advertised for sale in the education market. Probably less than 10 percent of the programs fall into the category of good to excellent; some more conservative estimates place this figure at less than five percent. It is our challenge to select courseware to meet our students' needs from among the relatively few good programs now available.

THE EVALUATION PROCESS

Prior to beginning a critical review of courseware, it is helpful to select an evaluation instrument, guidelines or other standardized criteria. *The Guidelines for Evaluating Computerized Instructional Materials,* published by the National Council of Teachers of Mathematics, is one of the most carefully developed instruments. These guidelines are easy to read and have relatively simple forms. The guide is not geared just for mathematics, so teachers in any subject area will find it useful. The MicroSIFT *Evaluator's Guide for Microcomputer-Based Instructional Packages* is more complex, requiring careful study and a longer time to complete the forms. It is more appropriate for an in-depth analysis of a courseware package or for use by courseware developers or publishers. Each of these guides presents evaluation criteria and a thorough discussion of the evaluation process. A shorter evaluation form developed by The California Library Media Consortium for Classroom Evaluation of Microcomputer Courseware is designed as a training tool for teachers in identifying some of the important evaluative criteria.

The next step is to select and obtain courseware for review. The next article discusses where to find critical reviews that can be helpful in making initial selections. These critical reviews are not to be confused with the publishers' announcements that are often reprinted from advertisements without any evaluation of the actual product. Critical reviews are best used to select programs for on-site evaluation. They should be considered to be a buying guide only as a last resort; previewing the courseware with the students who will be using it should be part of the selection process whenever possible.

Many courseware publishers and distributors now have a free 30-day on-approval policy, usually requiring an official purchase order. The primary advantage of ordering from such a source is that the courseware can be previewed in the classroom where student reactions will frequently modify an instructor's original opinion of the material. Courseware can also be previewed at conferences, software demonstrations, computer stores, district or regional centers, or at other schools. Some sales representatives will bring courseware to a school or district for preview. One innovative approach is the "software fair" or preview day to which publishers, jobbers and educators from a large region are invited for the specific purpose of previewing a wide variety of courseware. All of these alternatives should be thoroughly explored before any courseware is ordered from a catalog description without the option of on-site preview before purchase.

After a courseware package has been obtained, there are three questions to be addressed before beginning a serious evaluation. In most cases a negative answer to any of the three may well eliminate the courseware from further consideration.

1. Does the program run on my equipment?
2. Does it meet a curriculum need at my school?
3. Does it represent a valid use of the computer?

These questions may appear too obvious to warrant discussion, but they are all too often ignored. Courseware is *not* transportable from one system to another and must match the exact configuration of equipment available at a specific site, including any required peripheral devices. Most courseware is selected to meet one or more stated curriculum objectives and should be evaluated in terms of those objectives. Even an outstanding program may be of little value if it does not fit into the curriculum. Finally, much of the courseware currently on the market appears to make only a trivial use of the computer. If the program merely replicates some task that is already being done well with a textbook, workbook or other traditional medium, its purchase would seem to be a waste of courseware funds.

EVALUATING THE PROGRAM

Several teachers, students and other staff members should become involved in the evaluation. Courseware is often used in more than one classroom and at several grade levels. Different teachers will emphasize different criteria. It is especially helpful for each teacher to use the package individually, preferably in the classroom, and then to discuss it critically with other reviewers before making a purchase decision. The evaluation steps outlined below are designed for one teacher, but they can be repeated by each person involved in the review.

1. **Be yourself.** Read the documentation, paying special attention to any stated or implied goals and objectives and to the instructions. When a management system is part of the courseware, try to assess how useful it might be and whether it will be easy to implement.

2. **Be a "good" student.** Go through the program in a positive manner. Follow instructions and try to do well. Ask the following questions:

Can I follow the instructions and understand what I am supposed to do?

Am I bored by the program, or does it challenge me to perform well?

As a good student, have I learned anything or developed new concepts?

Was it fun? Would I want to run it again or use it with a friend?

3. **Be a "bad" student.** Make a great many errors. Get confused and try to return to the instructions for help. Miss the same problem/question several times in a row and see what happens. Then ask:

How do I feel about this program and about the computer?

How do I feel about myself? Did the program make me feel dumb or did it help me to feel successful?

Did the program help me when I made an error? Did it just say "try again" when I was already doing my best, or if I was guessing?

When I made an error, did the program branch to easier materials, present items more slowly, or explain the lesson in several different ways to help me?

Was there a beep or other noise that let the whole class know when I made an error?

Did I learn anything?

Would I ever want to use this program again?

4. **Be a "negative" student.** Press RETURN/ENTER unexpectedly. Ignore the instructions and press all of the wrong keys. Put in a number when the program asks for a letter. Be uncooperative. See how the program handles your antagonism:

Could I crash the program?

Did I get any insulting responses, or did I get only a patient prompt that suggested what I should do?

Was it fun to fail? Did I get a more interesting graphic reward—the person was hanged, something exploded, the boat sank—when I gave the wrong answer?

Could I put a lot of crazy stuff on the screen or was the keyboard locked against unwanted responses?

Did I eventually get interested and become involved in the program almost in spite of myself?

These questions will help to identify truly creative and well-designed courseware. Many programs deal fairly well with the good student unless they are, unfortunately, boring. It is in responding to student errors, intentional or otherwise, that a program designer has the opportunity to show imagination and to use the power of the computer to present material in new and more helpful ways.

Once you are familiar with the program, you will want to use it with your students, either individually, in small groups, or with the entire class. Students can be asked to complete some type of evaluation form or can be informally polled in discussions following the use of the program. Their reactions will provide additional insight into the potential value of the program being considered. Note especially whether most students complete the program without urging, want to repeat the program, or seem eager to share it with their friends. Then complete the evaluation form you have selected.

The final purchase/non-purchase decision should be based upon the opinions of the teachers involved, the reactions of students, and the relevance of the program to the curriculum. High standards must be established, and our final decision should reflect our determination to select only the very best from among the many programs available.

New courseware is appearing almost daily, and its quality is steadily improving. Any purchase should be deferred until there is enthusiastic agreement among the reviewers that is appropriate to the objectives of the school and truly represents an effective use of the computer. We control the marketplace by our decision to purchase or not to purchase a specific program and can encourage the development of creative and interactive programs by our refusal to purchase anything less.

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Identifying Equitable Software

by
Raymond Rose

The state education departments in California and New York have begun to include screening for sexism, racism and other forms of bias in their review procedures of educational software. Currently there are over 20 states which have state law, regulation or policy requiring that instructional texts or materials be reviewed for equity. In Massachusetts, the state equity law, Chapter 622, requires that all instructional materials be reviewed for equity. This has been interpreted to include instructional software.

The forms of bias and discrimination have been categorized by McCume and Matthews *(Implementing Title IX and Attaining Sex Equity: A Workshop Package for Elementary-Secondary Educators,* U.S. Department of H.E.W., 1978) as:

1. **Exclusion/Invisibility**—the complete or relative exclusion of a particular group or groups in the content and illustrations of the material.
2. **Stereotyping**—portrayal of racial-ethnic group members as well as males and females with regard to only one particular attribute, characteristic or role.
3. **Imbalance/Selectivity**—the presentation of only one interpretation of an issue, situation or group of people, especially based on stereotypes.
4. **Unreality**—the tendency to ignore facts which are unpleasant or which do not conform with the value system of the majority culture.
5. **Fragmentation/Isolation**—the separation of the study of minority groups and women through the establishment of separate units (e.g. History of Black Americans, Careers for Women), which imply that these groups are unrelated to the experiences of the dominant culture.
6. **Linguistic Bias**—the use of the generic "he" is an obvious source of bias. The use of exclusionary language and job titles (e.g. postman, fireman) is a more subtle and common form of linguistic bias.

The staff member that is given the responsibility for the review of instructional software needs to receive specific training to understand the types of bias and discrimination which are possible. Most software review forms, if they address the issue of bias and discrimination, do so with only a single question, which for the untrained reviewer will not address the subtle issues which are the most pervasive in instructional materials.

Look at the human factors involved in the program and supplementary materials. Will the motivational strategies used in the program be motivators for all your students? Does the program use a shoot-them-up arcade game format that turns off some students? Does the program use visual images of people? If so, are both females and males represented? Are both sexes represented in the text? Are different racial and ethnic peoples included in both the text and in the visual images? Instructional materials should, on the whole, present a variety of positive images of males and females, a variety of racial and ethnic groups as well as including disabled persons and a range of ages.

"Instructional materials should, on the whole, present a variety of positive images of males and females, a variety of racial and ethnic groups, as well as including disabled persons and a range of ages."

If the software evaluation form you are now using addresses the issue of equity with just one general question, you might consider adding these items:

Yes	No	None	
			Language free of:
			Sex bias
			Race bias
			Cultural bias
			Women are proportionately represented in text.
			Minority group members represented in text.
			Contributions of all racial and ethnic groups and women and men presented in realistic and/or accurate ways.
			A variety of ages are represented.
			Disabled persons are represented in a variety of roles.

END■

(Raymond Rose, Program Specialist, The New England Center for Equity Assistance, located at The NETWORK, Inc., 290 South Main St., Andover, MA 01810.)

Preview Center Criteria: A Survey Summary

by
Ann Lathrop and Vicki Smith

In the August/September issue of *The Computing Teacher,* the stage was set for a forum regarding software preview centers. Educators and software publishers have had, for a number of years, a dilemma regarding the circulation of software for preview. Educators want and need to look at software prior to purchasing. But software publishers cannot possibly mail a program to every educator who wants to preview it.

Regional preview centers were set up several years ago in order to solve the problem. They would provide an opportunity for educators to preview software without spending money, and for software publishers to distribute reasonable numbers of products for preview without worry of copyright infringement.

What has happened, in many cases, is that even though regional centers have been established, teachers continue to request preview copies of software. Because the centers have varying procedures and guidelines as to how they are maintained, publishers have difficulty identifying those centers which are more appropriate than others for handling preview materials. They find it frustrating to forward a software package to a school or individual, knowing a preview center is nearby—or wondering if one is. These concerns are voiced whenever this topic is discussed.

Last December, such a discussion took place at a conference for software publishers. We were addressing the group on the needs of preview centers. (Vicki is past president of the International Council for Computers in Education and coordinator for computer-based instruction at Region IV Education Service Center in Houston, Texas, where she coordinated a statewide software evaluation project for four years. Ann is library coordinator at San Mateo, California, County Office of Education, where she is in charge of the California TECC Software Clearinghouse and the Technology In the Curriculum [TIC] Update Project. They have worked together on the Educational Software Evaluation Consortium, which Ann annually organizes and chairs, producing *The Educational Software Preview Guide,* for which she serves as editor.) During the session, a publisher posed the question, "Is there some way you could help us in identifying or certifying preview centers?" It seemed like an excellent idea, but one that would be difficult politically to pull off.

Brainstorming continued even after the session. How could we determine "the best" of the centers? What criteria would we use? How would we expect a preview center to be run? A commitment was made to an ongoing dialogue among software publishers and directors of statewide or other large preview centers. In June, a number of representatives from the two groups involved attended a follow-up meeting at the National Educational Computing Conference in San Diego. We discussed suggested criteria for identifying preview centers, development of policies and procedures, and the role of schools in the process.

The Original Survey

We compiled and distributed a list of 24 suggested criteria for ranking. Each participant ranked the items below in order of importance.

1. Adoption of an official copyright policy to protect the publisher from unauthorized copying of software placed in the preview center
2. Willingness to sign letter of agreement/commitment or contract
3. Equal treatment given to all publishers
4. Geographic region served
5. Number of educators who have access to the preview center
6. Days and hours the preview center is open
7. Computers/peripherals available for use with software
8. Effective management of preview center ensuring that educators have accessibility to all materials
9. Software displayed effectively, with adequate shelving, appropriate packaging, attractive and well-maintained facility
10. Staff available to assist educators in using the software, especially with complex programs, management systems, tools, etc.
11. Support/endorsement by state education agency/department
12. Evaluation forms, guidelines or other established criteria to assist educators in previewing the software
13. Space to display catalogs
14. Willingness to distribute catalogs
15. Space and staff available to host vendor sessions/demonstrations
16. Newsletters/flyers sent to educators to advertise new software packages

17. Accurate, current information on software available for preview is maintained and disseminated to educators in print and/or online
18. Classes/workshops providing training in software evaluation, integration of software into the curriculum, use of tool packages, etc.
19. Statistics on number and types of users available to the publisher
20. Copies of evaluations or other user feedback available to the publisher
21. Names and addresses of educators visiting the preview center made available to publisher (with consent of educator)
22. Will return software when requested to do so by publisher
23. Will accept "demo disks" if they provide a good, interactive representation of the software package and include documentation
24. Policy regulating loan of software to schools/educators to protect publishers' rights

The respondents' data was broken into three groups: "More Important," "Important," and "Less Important." Six of the 24 items appeared in the top third, "Most Important," category at least 16 times. The next most popular appeared only 11 times. In order, the highest ranked were:

Item 1—adoption of copyright policy
Item 10—staff available for assistance
Item 5—number of educators having access
Item 8—effective management of the center
Item 24—policy regulating loan of software
Item 17—accurate, current information on available software disseminated in print and/or online

The highest agreement among the publishers was on the items regarding the number of educators having access to the preview center. Four of the 17 respondents in the publishers category ranked this as number one, and more than half placed it in the top third, or "More Important" category. None of the preview center respondents ranked this item first, although seven of the 10 ranked it as "More Important."

Five of the 10 preview centers ranked the adoption of an official copyright policy (item 1) as their first consideration. Three of the 17 publishers also ranked this first. Nine preview centers and 10 publishers placed it in the "More Important" category. Only two publishers and none of the preview centers placed this item in the "Less Important" category.

Three publishers and one preview center selected effective management of the preview center (item 8) as their first consideration. Two-thirds of the publishers and over half of the preview centers placed it in the "More Important" category.

More than half of the publishers ranked four other items in the top third, none being ranked number one. These focus on the effective use of the preview center by educators. The highest agreement, with 12 publishers placing it in the top third, was the dissemination to educators of accurate, current information about the software available for preview (item 17). Newsletters and flyers informing educators of new materials (item 16) also ranked in the publishers' top third, with nine votes. Ten publishers placed competent preview center staffing (item 10) in the top third. Finally, copyright concern was addressed again, with nine publishers and seven preview centers ranking policy regulating loan of software (item 24) in the top third.

The item of least importance to publishers was the willingness of a preview center to return software upon request (item 22). Their second least important item was the willingness of a preview center to accept demo disks instead of a full package (item 23).

The preview center respondents were unanimous on only one item: Releasing to publishers the names and addresses of educators who use the preview center (item 21) was a very low priority. Several indicated that this should not even be regarded as a possibility. Publishers were almost evenly divided on this item, with responses all across the scale.

Two preview centers ranked providing equal treatment to all publishers (item 3) as number one, and half of the centers placed this item in the top third, yet only five publishers assigned it to the "More Important" category. A second item of wide divergence between the two groups was the availability of computers and peripheral devices for use with the software (item 7). Seven of the 10 preview centers placed this as "More Important," while over half of the publishers assigned it to the "Less Important" category.

Other publishers' selections for their most important criterion were spread across the survey. For example, the number of educators having access to the preview center (item 5) was ranked first by five publishers and was ranked "More Impor-

tant" by five additional publishers, yet two publishers ranked it in their lowest category. In contrast, the preview centers' rankings show much greater agreement. Differences of opinion between the preview center and publisher groups were expected, but the wide divergence of opinion within the publishers' group, often more marked than the differences between the two groups, was an unexpected result of the survey. The following chart illustrates the items' ranks according to number of responses. It should be noted that almost every cell has at least one vote.

Item #	More Important (top third)		Important (middle third)		Less Important (bottom third)	
	Pub	PC	Pub	PC	Pub	PC
1	10	9	4	1	2	0
2	5	4	3	4	8	2
3	5	5	4	3	7	2
4	4	4	4	3	8	3
5	10	7	5	3	2	0
6	3	2	3	7	10	1
7	4	7	3	3	9	0
8	11	6	6	4	0	0
9	6	4	10	6	1	0
10	10	8	5	1	2	1
11	4	2	8	4	5	4
12	4	6	10	4	2	0
13	3	0	10	3	3	7
14	3	0	8	3	6	7
15	5	0	7	3	5	7
16	9	0	4	2	4	8
17	12	4	3	4	1	2
18	7	2	8	8	2	0
19	6	0	5	3	5	7
20	6	1	4	3	6	6
21	5	0	7	0	4	10
22	1	1	1	4	14	5
23	3	0	2	2	11	8
24	9	8	5	2	2	0

Note: All respondents did not mark all items.

The New Survey

The items in the original survey have now been reduced from 24 to 10. Any item selected as "More Important" by half or more of the respondents in either category remains in the survey. These included items 1, 5, 8, 10, 16, 17 and 24, placed in the top third by both publishers and preview centers; and items 3, 7 and 12, placed there by preview centers only.

As a cross-check, the number of publishers and preview centers ranking each item as "Less Important" was also tabulated. Only one item that was ranked "Less Important" by 10 or more respondents was retained for the second survey. This was item 16, ranked "More Important" by over half of the publishers and "Less Important" by four publishers and eight preview centers. It was retained in an effort to reach some consensus in the second survey.

We would now like input from the readers of *The Computing Teacher*. We ask you to complete the following survey by ranking the 10 suggested criteria for identifying a software preview center. Please number each item from 1 (most important) to 10 (least important). Star (*) any items you think should be required. To have your ranking included in the final results, your survey form should be completed and received by Monday, December 1, 1986. From this survey data, we will draft a policy paper similar in format to the ICCE Policy Statement on Network and Multiple Machine Software. Included will be suggested guidelines for software publishers, software preview centers and schools as they jointly work through the process of previewing educational software. Your input and ideas are appreciated!

Preview Center Criteria Survey

Number the following 1 (most important) to 10 (least important). Star (*) any you think should be required in the criteria for *any* preview center.

____ Adoption of an official copyright policy to protect the publisher from unauthorized copying of software placed in the preview center

____ Equal treatment given to all publishers

____ Certain number of educators have access to the preview center

____ Computers/peripherals available for use with the software

____ Effective management of preview center ensuring that educators have accessibility to all materials

____ Staff available to assist educators in using the software, especially with complex programs, management systems, tools, etc.

____ Evaluation forms, guidelines or other established criteria to assist educators in previewing the software

____ Newsletters/flyers sent to educators to advertise new software packages

____ Accurate, current information on software available for preview is maintained and disseminated to educators in print and/or online

____ Policy regulating loan of software to schools/educators to protect publishers' rights

Name: _____

Position: _____

Company/School: _____

Address: _____

_____

Phone: _____

Please complete and return by Monday, December 1, 1986 to:

Preview Center Survey
c/o ICCE
University of Oregon
1787 Agate Street
Eugene, OR 97403

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The Computing Librarian

Edited by Carol Truett

The Curriculum, The Computer and The Magic Spark

by
Joanne Troutner

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Students in the world history class are busily working on their strategies for bringing about world peace in a computer simulation, *The Other Side*, and commercial design students are laboring over developing product logos with the Logo computer language in the computer lab. Language arts students are researching the history of codes and developing their own clues for use with *CodeQuest*, and a group of reading students are working on writing the directions for making bookmarks with *Print Shop*. If these activities are not happening in your school and the computers are often sitting idle, perhaps you need to examine your involvement with these wonderful teaching tools. You, as the school library media specialist, are in a perfect position to see that the computer is integrated into the classroom as a teaching tool. You already possess the creativity, perseverance and instructional design expertise necessary for this role. And who else in the school has contact with the entire staff in an informal, non-threatening manner? You are a natural to take on the task of being the "magic spark" in the curriculum integration formula.

First, however, it is necessary to become familiar with the three stages of software integration into the curriculum and the classroom. Stage one requires computer courseware which integrates into the curriculum with only a change of media. Drill and practice, tutorial and teacher utility programs work well in this area. Stage two requires computer courseware which integrates into the existing curriculum, but requires a higher level of computer literacy and a change in the methodology used by teachers. The excellent problem solving programs, authoring languages, and programs which allow teachers to add their own material are examples in this area. Stage three contains computer courseware which requires a change in the organization of the school, training of teachers, and the objectives and methodology used in the classroom. Simulations, interactive video, data bases and other application programs fit into this category.[1]

After you have selected several programs which fit into these categories, the task of seeing where they fit into the curriculum must be tackled. In this stage it is easy to become so enamored with a program that you attempt to push it into the curriculum whether it fits or not. Resist that temptation; it will lead to little more than wasted effort and frustration. Instead, look for an area of the curriculum which is currently being taught, then search for that piece of software which will enhance the concept. Teachers will be much more receptive to your efforts if you remember this principle.

Consider the following ideas as you become the "magic spark" in the computer-curriculum connection. Science teachers are always trying to teach problem solving skills; they will be delighted with Sunburst's *Discover* and *Planetary Construction Set*. *Discove*r provides students with the opportunity to keep alien creatures alive in a controlled atmosphere. Introduce your science teachers to this program and help them develop a way to evaluate student achievement on the program. Offer to host a grade-level tournament on *Planetary Construction Set*, where students use their knowledge of the solar system to actually build planets.

Lanugage arts teachers will be delighted to discover SVE's *Mad Libs Writer*, which uses the ever popular Mad Libs format to teach grammar and writing. *Wally's Word Works* by Sunburst, which provides practice on the parts of speech and allows the teacher or student to insert material, will also be popular and easily fit into the existing curriculum.

Social studies teachers have a variety of economic simulations to use. Educational Activities' *South Dakota* and *Land of the Rising Sun* are excellent tools for helping teach economic concepts and can easily be used with an entire class at one time. *PFS: File* data bases developed by Scholastic provide a treasure trove of teaching ideas and situations. Again, your help in designing the lessons and teaching data base search strategies will provide the needed spark.

Finally, one of the most versatile programs currently available for use in the problem solving area is *CodeQuest* by Sunburst Communications, Inc. This program provides a student with practice in breaking a variety of seven codes and using a number of problem solving skills. In the program, the student tries to decode six different clues in order to identify a mystery object. The codes may be of seven different types in-

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cluding simply having the clues written backwards, a series of numbers which stand for letters, a code using only pictures to represent letters, or a Super Sleuth version where the computer picks a code at random from any of the types. Students work at their own pace and may save game progress on the disk at any point. A help option provides the student with further information about the type of code being used. The teacher option in the program allows you to enter your own mystery objects and clues and delete student games.

Consider how this courseware might be used in social studies classes. Students might research the history of codes up to present-day applications. A bulletin board can be developed by students on historical figures who have relied on codes. The teacher's option can be used to enter mystery objects relating to current events for the week. A class can hold a "Famous Person" challenge by simply assigning groups a specific historical figure to research and having them develop and input the clues for that person. A large screen monitor or television could be used for each group to challenge the others in class.

And *CodeQuest* is not just limited to use in social studies. Language arts classes might develop mystery objects and create clues which are all adjectives, nouns or some other part of speech. Students could write mystery stories which use *CodeQuest* to solve the mystery. A biography unit could be centered on famous spies and the role that codes played in their lives. Science classes might use the solving of clues to reinforce the scientific problem solving process. In addition, students could write clues about mystery objects for a particular unit of study. Mathematics students could pick a particular mystery object and analyze the number of times a certain letter appears in the clues and then graph those results. Clues could be developed for famous mathematicians to serve as mystery objects. Finally, art students might develop their own pictorial codes as a result of using *CodeQuest* to study famous artists.

Teachers in any subject area may use the teacher option to customize the mystery objects to a particular unit and to be working at stage two of software integration into the classroom. After the teacher's mystery objects have been entered, the program may then be used as the basis for a learning center in a corner of the room, as an assignment to be completed sometime during the week in the library media center, or as the focus of a team exercise during class. The following task cards give ideas for use with computer literacy and social studies classes and provide you with a start for becoming that necessary "magic spark" in the world of computers and the curriculum.

[Joanne Troutner, Library Media Specialist and Educational Computer Coordinator, 3002 Roanoke Circle, Lafayette, IN 47905.]

Reference

1. "Integrating the Computer into the Curriculum," Conference on Instructional Computing, Indianapolis, IN, March 18, 1985, Sue Talley, Apple Computer, Inc.

Photocopy, mount on 4x6 cards and laminate.

Task Card ***Computer Literacy***

Computer Trivia

A. Pick a specific use of the computer such as telecommunications, word processing, programming or graphics. Develop at least three sets of six clues describing the application you pick. Put them into *CodeQuest*. Attempt to stump your classmates.

B. Select a person who has helped develop some type of computer. Research this person's life and produce six clues which describe him/her.

C. Write six clues which describe your favorite brand of computer.

D. Research at least three different computer languages. Develop clues for *CodeQuest* on each language.

Task Card *Social Studies*

Which President Is It?

A. Can you guess which President this is?

1. A Massachusetts native
2. A graduate of Harvard
3. Fond of playing touch football
4. Commander of PT 109
5. Wrote *Profiles in Courage*
6. Assassinated in Dallas

B. Pick at least five different Presidents of the United States and develop your own set of clues. Put your clues into *CodeQuest* and test your classmates' knowledge.

Task Card *Social Studies*

Famous Inventors

A. Who is this inventor?

1. Born in Scotland
2. Professor at Boston University
3. Interested in speech and deafness
4. Developer of the hydrofoil
5. Developer of the telegraph
6. Developer of the telephone

B. Develop a list of other famous inventors. Make a time line which shows their inventions.

C. Pick five inventors from your list and five inventions from your time line. Develop sets of clues for each. See how many classmates and other teachers you can stump.

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SOFTWARE TOOLS

A One-Semester Secondary School Computer Course

by
John Bromley and John Lakatos

Why Another Kind of Course?

It is clear that increasing numbers of people want and need to use a microcomputer. Students, as a group, are no exception. And, like the general population, their precise needs may vary; not all students are ready to learn—or need to learn—a programming language.

Enter Software Tools, a new one-semester high school course! The goal here is for students to learn to use the computer as a tool by becoming familiar with a variety of commercial software programs. It was designed to allow even less academically able students to succeed and to develop confidence in their ability to use a computer to do useful work. No prerequisites were set for the course (although we recommended that students take typing first), and the level of mathematics in all examples used was kept low in order to encourage reluctant math learners.

The course proved very popular with students in our school and in its first year has generated an enrollment of 107 students (27 percent of the school's population)!

Course Outline

I. Data Base System
   - A. *PFS: File*
   - B. *PFS: Report*
   - C. *PFS: Graph*

II. Word Processing Systems
   - A. *Apple Writer IIe*
   - B. *Sensible Speller IV*

III. Spreadsheets
   - A. *The Spreadsheet*
   - B. Topics
     1. Design of Sheet
     2. Use (What If?)
     3. Saving and Printing
     4. Replication
     5. Functions

IV. Apple Operating Systems
   - A. DOS 3.3
   - B. Pascal
   - C. ProDOS
   - D. The Law and Disk Protection

V. Telecommunications
   - A. Hardware
   - B. *Data Capture IIe*
   - C. Information Utilities—*The Source*

VI. Integrated Software
   - A. *AppleWorks*
   - B. Topics
     1. Data Base
     2. Word Processor
     3. Spreadsheet
     4. Clipboard

VII. Drawing and Graphics
   - A. Logo
   - B. *Mouse Paint*
   - C. *Print Shop*
   - D. *Micro Illustrator*
   - E. Printing and Saving Graphics

Course Requirements

Software Tools is designed to be lab oriented. Students begin using the computers on the first day of class and spend approximately 85 percent of the total class time using them (the other 15 percent is used for lecture, audiovisual presentation and student evaluation). You need four important items to begin this kind of computer course.

- A computer lab with a low student/machine ratio (our ratio was 1.6 students per Apple IIe, but a ratio of two to one should work almost as well).
- Sufficient copies of software to allow all machines in the lab to run most programs simultaneously. This is less costly than it might seem, as many software companies now offer multiple copy discounts for school use. Information on prices and availability changes often—it is important to find out the current pricing policy of each publisher.
- The teacher must have worked with each of the programs in order to develop experience and confidence with them. (We spent many hours after school developing this experience.)
- You will need to reproduce command charts and other notes about each program; we found no suitable textbooks.

Creating such a course is not an easy project, but student satisfaction and enrollment has made it more than worth the effort.

Programs Used

This section details the programs we used with Apple IIe computers. If your lab doesn't use Apple IIe's, different programs will have to be selected. Nevertheless, the rationale and descriptions should be helpful.

I. Data Base

It was important that the course start with simple programs and work toward more complicated tools as students' confidence increased. For this reason we selected the *PFS* (Personal Filing System) series of programs for our first unit. Students found the programs easy to learn but powerful enough for most of their perceived uses. The manuals for

PFS: File, PFS: Report and *PFS: Graph* are well written and provide good instruction for the programs.

We started computer use the first day by encouraging students to search a data base created with *PFS* that included the names, grade levels, student numbers and computer course enrollment of all the students in the school. They first searched for their own name. The excitement of finding that the computer "knew" them was a good way to start the course. Students went on to create their own data bases—address books and listings of personal tape cassette collections were both popular—and then to experiment with different report and graph formats.

II. Word Processing

We decided to use *Apple Writer IIe*, a very powerful and flexible word processor with a relatively simple editing and printing command structure. A useful printed tutorial chapter is included in the User's Manual. During this unit a number of students also had time to explore the "electronic dictionary" *Sensible Speller IV*, and used it to check and correct the spelling in their work. Students tell us that this unit is the most useful one of the course. Other teachers in the school comment on how nice it is to receive typed essays and reports.

III. Spreadsheets

We chose *The Spreadsheet*, a program modeled after *VisiCalc*, but with a simpler command structure for printing, loading, saving, etc. The manual includes a 90-page tutorial on the command structure of the spreadsheet.

The real challenge in teaching about this software tool (and to some extent all the other programs) is to design an interesting assignment/project. Most students have never seen a spreadsheet and have little interest in learning the complexities of entering formulas, etc. We found that these three assignments motivated them.

- Seniors developed a budget for going off to a college or university. They used catalogs and tried to keep the budgets realistic.
- Younger students imagined that they were running a record/cassette store and developed a balance sheet for their store. These profit/loss sheets were less realistic than the college budgets, but were defended by the students with vigor.
- Students developed a spreadsheet model that would calculate their current GPA (Grade Point Average).

IV. Apple Operating Systems

This unit was integrated throughout the course by necessity. The *PFS* series saves its data on a Pascal-formatted disk, *The Spreadsheet* uses Apple DOS 3.3, and *Apple Writer IIe* now uses the new Apple ProDOS format. Since students were required to create files on their own disks, the different (incompatible) formats presented many opportunities for explanation and learning. Most of this instruction occurred while debugging student problems, and much of the topic was taught one-on-one or in small groups as the information was needed. This unit turned out to be the hardest for most students—we were always helping students who wanted to save a ProDOS file on a DOS 3.3 disk.

"The goal here is for students to learn to use the computer as a tool by becoming familiar with a variety of commercial software programs."

Another topic we discussed throughout the semester was disk copying, disk protection and copyright laws. Almost every day we had to explain that, "No, you can't copy that disk. The authors and publishers of that software deserve to make some money from their investment." Following this "no copying" rule involves a lot of enforcement, as well as educational effort.

V. Telecommunications

Students practiced less with computer telecommunications than with other units, because of the expense of hardware, international long distance charges, and information utility time. We used *Data Capture IIe* for this section of the course. The program has good screen menus and is relatively easy to use. We do, however, feel that telecommunications is an important aspect of the future of computing and are planning to expand the time devoted to this activity. Perhaps the development of bulletin board and information utility simulators will help reduce "on line" charges.

VI. Integrated Software

Another growing field of importance in microcomputing is the use of integrated software. We chose to introduce students to *AppleWorks*, which includes a data base, spreadsheet, word processor, and a "clipboard" that allows the transfer of files between the modules. This program package comes with a two-disk, interactive tutorial. Also provided is a thick tutorial manual and a disk of sample data with which to practice. By delaying the introduction of the integrated package until late in the course, students had the chance to develop a good feel for the generation of the different elements in the program. Students were required to demonstrate their mastery of the program by creating a small data base and spreadsheet model and then transferring both to a letter they had written with the word processor.

VII. Drawing and Graphics

The finale of the course, and the part most enjoyed by students, was a unit on computer graphics. Students worked with at least two different graphics programs. We had available *Micro Illustrator* (the KoalaPad program), *Mouse Paint, Print Shop* and Logo. None of these programs, with the exception of Logo, which we used as an extra credit assignment, require much instruction. The graphics programs are easy to use without manuals or tutorials. Student assignments asked students to draw and print a graphics image with at least two of the listed programs.

Student Evaluation

One of the least rewarding jobs of a teacher is assigning grades. In this course the evaluation is made more difficult by the wide range of student abilities. We calculated the grades based on the following system:

50%—Printout of completed assignments
20%—Written quizzes on programs

20%—Practical quizzes using programs
10%—Student notebook of handouts, printouts, etc.

Of these, the practical on-computer quizzes are innovative. These exercises took place about once every two weeks. Students were given a task or problem on the current topic and were required to find a solution within a time limit. These problems were designed to be easily graded by checking the computer screen at the end of the allowed time. Students could use notes and command charts, but could not ask questions of their friends. Since only about half of the class could use a computer at a time, the other half was sent to another classroom for half of the period, and then the groups swapped places.

Students seemed to enjoy the change of this type of practical quiz. They also learned that they could not learn how to use a program by just watching their lab partner. We found in general that the computers were highly motivating; students made quite good grades in the course—85 percent of the grades were either A's or B's.

Outcomes

In addition to teaching students how to use several different software tools, our course had other positive outcomes. A number of students who took the course decided that computers were not as hard or mysterious as they had thought. As a result, many have now enrolled in Pascal or BASIC language courses. We were also pleased to have a much higher percentage of young women enrolled in the course than we usually have in programming classes (40 percent vs. 25 percent). Perhaps early success in the Software Tools course will encourage higher female enrollment in computer language courses.

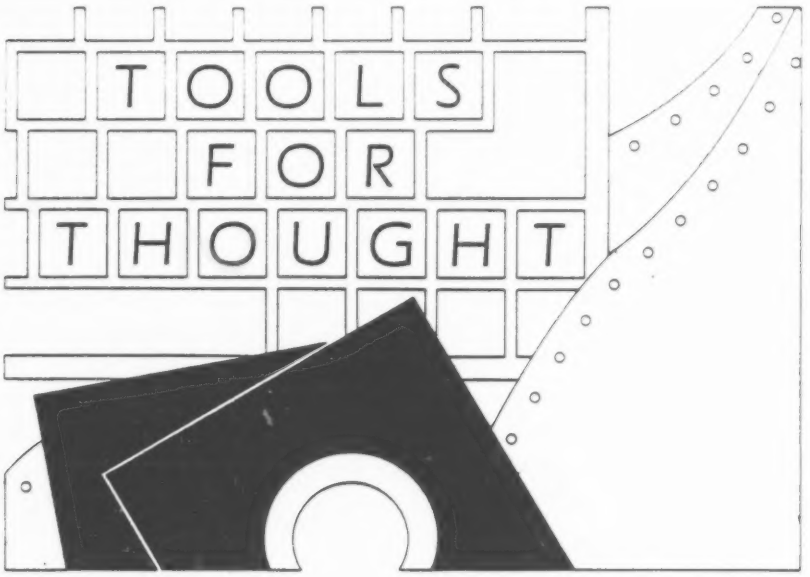
We feel that this course offers a very practical kind of computing literacy. While the course is somewhat costly in terms of computer and software resources, it seems worth the extra effort required to introduce a new course in a school. It has been an enjoyable course to teach. And students say they found it practical and useful, as well as enjoyable.

REFERENCES

Programs Used in Software Tools Curriculum

Publisher & Address	Program	Sample Assignment
Apple Computer Co. 20525 Marioni Ave. Cupertino, CA 94014	*AppleWorks*	Develop a personal data base, simple spreadsheet, and transfer the data to a letter using the "clipboard."
	Apple Writer IIe	Type and print a two-page report; the report should be an assignment from a different class.
	Mouse Paint	Draw a graphics image.
APPLE Co-op 290 S.W. 43rd St. Renton, WA 98055	*The Spreadsheet*	Develop a spreadsheet of about 20 rows by 15 columns, such as a college budget, record store profit/loss sheet or sheet to calculate student GPA.
Broderbund Software, Inc. 17 Paul Dr. San Rafael, CA 94903	*Print Shop*	Design and print a greeting card.
Koala Technologies Corp. 3100 Patrick Henry Dr. Santa Clara, CA 95050	*Micro Illustrator*	Use KoalaPad or paddles to draw, save and print a picture or record album cover.
Krell Software Corp. 1320 Stony Brook Rd. Suite 219 Stony Brook, NY 11790	*Logo*	For extra credit: Write a set of Logo procedures that will draw a picture on the screen.
Sensible Software, Inc. 210 South Woodward Suite 229 Birmingham, MI 48011	*Sensible Speller IV*	Use the program to check the spelling of the two-page required report.
Software Publishing Corp. 1901 Landings Dr. Mountain View, CA 94043	*PFS: File*	Create a data base of at least 25 items.
	PFS: Report	Print the data base using different search and report specifications.
	PFS: Graph	Draw at least two different graphs, entering data directly and reading it from a data base.
Southeaster Software 7743 Briarwood Dr. New Orleans, LA 70128	*Data Capture IIe*	Use program and modem to chat and/or transfer data to another computer.
The Source 1616 Anderson Rd. McLean, VA 22102	*The Source*	Use *The Source* menus to extract information.

[John Bromley and John Lakatos, The American School of Lima, Apartado 247, Miraflores, Lima 18, Peru.]



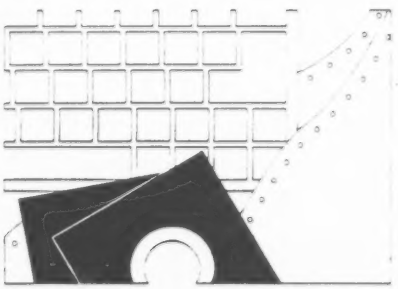
by
Janet Parker

Computer tools, particularly word processors, data bases and spreadsheets, hold great promise for providing students with activities that develop higher-level problem solving and thinking skills —skills that involve creating, analyzing, synthesizing and evaluating. Word processors can encourage the important revision stage of the creative writing process by facilitating rewriting, rewording and "playing with words." Data bases make it easy to search, sort and reorder large amounts of information to find patterns and identify trends. With spreadsheets, formulas and equations can easily be evaluated with different data to investigate the impact of variable changes and play "what if" games, analyzing the effects of different assumptions.

May we assume, then, that as more schools join the popular trend of having students use these tools, more and more students are developing these important thinking skills?

Not necessarily.

The *potential* for developing these skills is there, but it will not automatically be achieved by simply *using* tools. Tool-using activities span the spectrum from those involving lower-level, fairly mechanical skills, to higher-level activities which use the tools as "vehicles for thinking" to explore and manipulate words, data and ideas. We need to seriously consider *how* we are using these tools, develop more thoughtful approaches that clearly identify exactly what we want to achieve, then design class activities and procedures to do so.



Defining Higher-Level Thinking Skills

Based on Bloom's Taxonomy of Cognitive Skills, lower-level thinking skills are those of knowledge and understanding. With data base work, they might include:

- Entering data into a data base;
- Retrieving factual information; or
- Using data bases to organize lists.

With word processors:

- Inserting and deleting text;
- Saving and retrieving text; or
- Using find/replace to correct misspelled words.

With spreadsheets:

- Entering and editing simple values and labels;
- Evaluating equations of constants;
- Entering data and recording the results of the calculations; or
- Calculating simple expressions.

Higher-level thinking, on the other hand, involves analysis, synthesis and evaluation. With data bases, this might include:

- Determining what information is needed to test a hypothesis;
- Reorganizing and synthesizing data to test ideas and find non-obvious relationships;
- Discriminating between relevant and irrelevant information; or
- Drawing logical inferences and appropriate conclusions.

With word processors:

- Using freewriting to generate and develop ideas;
- Combining ideas into a new theme;
- Evaluating one's ideas through revising and editing; or
- Stating a position and giving supporting reasons.

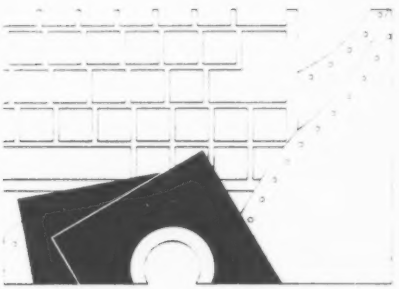
And with spreadsheets:

- Investigating the consequence of changing a particular value on other values of the spreadsheet;
- Making predictions; or
- Developing models and creating simulations.

Working with a data base of United States presidents, naming the president in 1820 or listing all the presidents born in Virginia would be lower-level tasks, while sorting the data to examine if the nation being at war makes it more likely for a president to be elected to a second term is a higher-level task. With the former example, one is merely receiving and communicating data, while the latter requires processing, interpreting and

synthesizing data. Likewise, using a word processor for correcting punctuation is lower level while using it to free-flow ideas is higher level. Using a spreadsheet to maintain a budget (entering data and recording the results) might be lower level, but using the budget to conduct forecasts on projected revenue (entering sets of different data and interpreting the differences among the results) would involve higher-level thinking.

In sum, our overall objective should be to use data bases, spreadsheets and word processors as inquiry tools to reason about and experiment with data and ideas, and to effectively use and present information.



Guidelines for Achieving These Objectives

1. **Know the importance of keyboarding.** Students need to be able to focus on ideas rather than searching for keys to effectively use computer tools.

2. **Have students work in teams.** There are advantages to teams of two to three students working together on computer tool projects. Teamwork encourages upper-level thinking as students share ideas, brainstorm, critique writing, and verbalize and defend strategies.

3. **Allow time.** Problem solving takes time—time to "futz" with the problem, try different approaches, think. When writing, students need time to reread, reword and rework not only their own, but also their peers' writing. When data bases are used for problem solving, students need time to explore the data base and follow the paths of questions they develop. Not all this need be in the computer room; scheduling off-computer time is helpful in encouraging students to plan strategies, interpret results and respond to each other's positions. But much time with computers is needed so students may become as fluent with thinking with computers as with pencil and paper.

4. **Begin word processing work with creative writing activities.** Students need to view the word processor as a tool to aid them in composing creative writing, not just editing. To emphasize this, begin word processing work with a creative writing experience using only simple insert and delete functions. Other commands can be left to learn as students need them, thus avoiding "information overload" with many fancy commands most students will never use. Minimize editing practice on a given text since it tends to emphasize often-meaningless manipulations and encourages an infatuation with the gadgetry of a word processor.

5. **Provide students with a concrete data base model before moving to computers.** Too many children, although able to run computer data bases, don't really understand what they're doing. A simple card sort activity, in which students physically manipulate index cards representing records of data, can provide understanding of what data bases are, how they work, and the importance of organizing data into fields. Adults can abstract these ideas, but students, especially middle and elementary students, need a physical representation of a data base.

6. **Provide experience using data bases before constructing them.** After providing a concrete model, the second step in data base work should be to *use* well-constructed data bases, not to create them. It is only after using three or four well-constructed data bases that students are able to grasp fundamental constructs that make data bases useful for research and inquiry. They then develop an appreciation for the potential of data bases for research inquiry. Without such appreciation, student-constructed data bases often result in little more than list makers. For example, a data base of books read, a popular first attempt, lends itself to little more than list questions: List books about horses, or by a certain author. On the other hand, a research/information data base might be one of countries of the world, that can be investigated for a relationship between per capita income and the literacy rate. Students will understand that computers are good for more than just lists after studying these significant relationships.

7. **Select quality data bases and structured activities.** Since the data bases students first use will provide models, it is critical that their data be of good quality and that the searches students carry out be significant, not just recalling factual information. Such searches will not be easy for students accustomed to factual learning, and they will initially need structured activities, such as well-designed worksheets that guide them through strategies requiring higher-level thinking. The Hunter materials (Hunter and Furlong, 1985) provide fine examples. Structured activities help students identify and develop good questions; without direct instruction, students have difficulty developing substantive questions, and the data base work may become a game of Trivial Pursuit. The strength of data base work comes in higher-level thinking, using good research questions. A data base is just a computerized workbook if you don't take advantage of these higher-order thinking skills.

8. **Emphasize organization and key words.** Experience in searching well-constructed data bases also helps students develop a sense of how important organization and terminology are in a data base, an understanding they will need later in constructing their own data bases. For example, searches are only successful if the search term is the same as that used in the data base; searching a data base of famous Americans using the word "Black" for the field "race" will not be successful if the data base uses "Negro." Only after such experiences will students

realize the importance of consistent use of keywords in the data, and that without consistent wording the data base can't search for commonalities and patterns.

9. **With spreadsheets, use carefully chosen examples that clearly illustrate the concept being taught.** Avoid complex economic or financial equations that impress viewers with the power of spreadsheets, but may overwhelm beginners. Instead, begin with exploring variables and formulas, modeling familiar situations such as distance/rate/time problems, or rate/time worked/total pay. As Art Luehrmann notes in "Spreadsheets: More Than Just Finance" (*TCT*, April 1986), first examples should be ones the students are familiar with. Then emphasis can be on critical concepts such as how cells may depend on other cells for their values, and how the values displayed are often the results of cell formulas. At the same time, examples should not be trivial problems more easily done on paper. Real-world examples appropriate to the students' level can emphasize application-level thinking and encourage students to make up their own problems for spreadsheet solutions.

10. **Provide explicit instruction that gives attention to higher-level thinking strategies.** Such direct instruction, which makes students more aware of the problem solving strategies they use, can be provided by teacher-directed activities and by structured computer activities as described above. For example, after helping students develop good research questions for their data base work, provide instruction in the general strategies for answering such questions: clearly identifying the question asked and data needed, breaking larger questions into smaller ones, etc. Word processing students also need direct instruction to focus them on higher-level thinking strategies. For example, they benefit from guidance on using editing features to make substantive revisions rather than focusing on superficial editing. With spreadsheets, encourage them to explore the various parameters of a problem by first predicting what would happen if a certain entry were changed, then checking their prediction.

11. **Discuss how to interpret data.** Work with your students to develop a concern for in-depth thinking, for discriminating relevant from irrelevant information, and for developing reasoned and supportable opinion. Getting data from a data base or spreadsheet is only the beginning; interpretations and inferences need to be drawn. Students need to be pushed beyond simple knowledge (lower level) of the data, toward analysis, synthesis and evaluation (higher level). You will have to work to take students beyond the level of simple data input, recall and listing, toward *evaluating* what they see, making inferences about what it means, and coming up with some kind of meaning in terms of solving questions or problems. Students will need to be pushed beyond the superficial to the substantive.

It is fairly easy for students to learn the mechanics of using the editing features of a word processor, the sorting features of a data base, or the recalculation features of a spreadsheet. But higher-level thinking with computer tools will not happen by itself. A few students, engrossed by the thought flexibility computer tools offer, may develop techniques themselves. But for these tools to reach their full potential on a broad scale will require thoughtful teacher intervention.

Show your students where the real power of computing lies, and help them develop better thinking skills.

[Dr. Janet Parker, Early and Middle Childhood Education Department, School of Education, University of Louisville, Louisville, KY 40292.]

References

Hunter, B. and M. Furlong, *Scholastic pfs: Curriculum Data Bases for U.S. History*. New York: Scholastic, Inc., 1985.

McLeod, R. and B. Hunter. *Scholastic pfs: Curriculum Data Bases for Life Science*. New York: Scholastic, Inc., 1985.

Software in the Classroom – A Form for Teacher Use

by
Cynthia Burt

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Classification and Specification

The first section, **Classification**, gives basic information on the package, the location (classroom, media center or lab, for example), and "special equipment," which includes hardware, software and peripherals needed, but also might include a set of encyclopedias, a map, or even pencil and paper.

Specification tells you about the contents and presentation. Subject area and specified topic are useful as curricula guides—for example, "math; multiplication of whole numbers." A grade level determination is noted here, as well as the type of program (often more than one will apply).

Many packages include an assortment of individual programs. These can be listed in the Menu section to maximize classroom use of the package. A mnemonic, such as a sketch of a particular screen, may help in the recall process. ess.

If Management and/or Record-keeping options are provided, the package will be more flexible and useful. It also means you may have to adjust parameters and prepare rosters before using the program with the class.

Many school districts and other organizations publish software evaluation forms that include general descriptions and categories such as "good documentation" or "ease of use." Another evaluation technique describes the software and analyzes it for strengths and weaknesses.

The analysis proposed here focuses on ***classroom use of a particular program after it has been reviewed and purchased.*** The intention is to provide you as a teacher with a systematic "recollection" of educational programs. It is not a purchase request to administrators nor does it necessarily constitute a recommendation to other teachers.

Such a method of recalling specific programs and their uses in a particular class will be valuable as the amount of software you have previewed and/or used increases. There are five sections, though not all sections need to be completed. Some information can be gleaned by a preview of the software, with more ideas added after the package has been used with the students. The analysis narrows its focus from general classification to the actual logistics of teacher and student involvement.

The Comment section is used to describe the program's attributes. Here it may be helpful to mention the suitability of a particular menu item, for example.

Lesson/Unit Involvement

The third section, **Lesson/Unit Involvement**, narrows the focus to the use of the package in your unit and lesson.

In what capacity is the package used? For remediation, for standard instruction or as an enrichment activity? Have you already developed a particular unit and lesson plan that the package could enhance or replace?

Now the purpose of the program can be determined. Does the package introduce a unit or review a lesson? Perhaps its best use is as a motivating activity or reinforcement. If management and record-keeping options are provided, it may also be appropriate for testing.

The last part of this section considers whole class and individual student management questions. Note any copyright restrictions: Can a single copy of the program be used with more than one computer at a time? Note here also whether the program is designed for individual use, or whether it can manage small groups of students. Still other packages can support a classroom demonstration. And regardless of the number of users, some kind of timetable is needed. Will students sign up to use the program? Is it realistic to assign a student to run the program at a specific time? Although the time needed to complete any program will vary somewhat from one student to another, tutorials and simulations generally take much more time to complete than a drill and practice program. For optimum use of any package, the time element must be considered.

The final two sections of the Use Analysis consider the logistics of teacher and student involvement. The section may be filled out before and/or after using the package in the classroom. This involvement will vary with each package, teacher and class. Remember, this is neither a purchase order nor a product review—these areas are to remind you about effective uses of the software in your classroom.

Teacher Involvement

Under **Teacher Involvement** you may wish to make notes about the need for orientation to a package. Sometimes a lesson or two is needed before the package can be used effectively. If management is provided, the roster may need checking and updating. Are the limits and ability levels appropriate for your students? While the program is in use, you may also want to monitor students' behavior or performance. (Exciting or very fast activities can sometimes encourage abuse of the keyboard.) After the program is used, does a score need to be recorded? (This may be critical for student reinforcement, especially if the program lacks management.)

The **Student Involvement** section can be used first to anticipate student use of the package. Do students need to sign up? Will they be able to comprehend the directions? Is the program likely to encourage verbal responses? If so, will this disrupt the rest of the class? Are the graphics likely to distract students from the subject matter? Will they know how to respond to the program's queries? How will students know when their time is up? Can they recognize the end of the problem set? Will they be responsible for recording their own scores?

Organizing Your Data

There are numerous ways of filing your Classroom Use Analysis sheets. You may want to maintain a private notebook by subject area of both suitable and unsuitable programs. This notebook will become a real time saver when searching for an appropriate program and avoiding inappropriate ones. Having the analyses in one portable notebook will also remind you of packages you've reviewed previously.

You may also want to file each analysis sheet with the appropriate lesson plan. Then, as you prepare a unit, the program can be easily integrated.

If you are very organized, you may want to combine the two methods. A small address-type book can hold the names and publishers of the programs you have viewed, while the lesson plans contain the analysis sheets.

And last, each program could be filed with a notebook of all use analyses gathered for it by all those previewing and/or using the program. A good way to share ideas and save time! The notebooks could be kept in the media center, where the analyses could be entered and maintained on a data base. Using software in the classroom can enhance learning and offer rewarding experiences if you plan for its effective use.

EDUCATIONAL SOFTWARE—CLASSROOM USE ANALYSIS

DATE_____
SIGNATURE_____

1. CLASSIFICATION

NAME OF PROGRAM _____
PUBLISHER _____
AVAILABLE FROM _____ FOR_____
SPECIAL EQUIPMENT _____

2. SPECIFICATION

SUBJECT AREA _____ GRADE LEVEL _____
SPECIFIED TOPIC _____
TYPE:

- ☐ DRILL & PRACTICE
- ☐ TUTORIAL
- ☐ SIMULATION
- ☐ GAME
- ☐ PROBLEM SOLVING
- ☐ SKILL BUILDER
- ☐ OTHER_____

MENU: (title and mnemonic)

1. _____
2. _____
3. _____
4. _____
5. _____

MANAGEMENT _____
RECORDKEEPING _____

COMMENTS: _____

3. LESSON/UNIT INVOLVEMENT

USAGE:

- ☐ REMEDIATION
- ☐ STANDARD INSTRUCTION
- ☐ ENRICHMENT

PURPOSE:

- ☐ INTRODUCE
- ☐ REVIEW
- ☐ MOTIVATE
- ☐ REINFORCE
- ☐ TEST

UNIT: _____
LESSON: _____

CLASSROOM MANAGEMENT:
MUST DISK REMAIN IN DRIVE TO USE? ☐ YES ☐ NO

- ☐ INDIVIDUAL ☐ GROUP ☐ CLASS
- ☐ SIGN-UP SHEET ☐ ASSIGNMENT

TIME ALLOTMENT PER RUN_____
TOTAL TIME ALLOTTED_____

4. TEACHER INVOLVEMENT

PREPARATION: _____
USAGE: _____
SUMMARY: _____

5. STUDENT INVOLVEMENT

PREPARATION: _____
USAGE: _____
SUMMARY: _____

END

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Creating a Software Review Collection

by
Glenn Fisher

Are you getting bogged down in software reviews, which seem to be everywhere, but never so that you can locate the one you need? Here in Alameda County we, like many other districts, have a large collection of software reviews from many sources. In the past they could be found in the magazine rack, in the back issues area, in the Computer Center and on office shelves. When teachers came in to preview software or to obtain information about software, they found it almost impossible to locate reviews of specific programs. We needed a way to organize all the reviews. Here's what we did.

Our Solution

We established three separate collections of copies of all of the reviews.

Set 1

This collection of reviews is kept with the software available for preview. Specific reviews are filed individually with the folder containing that particular disk, so that anyone previewing a program has easy access to all its reviews.

Set 2

This collection is organized first by subject area and then by software title, so that a teacher looking for social studies software, for example, has easy access to all reviews within that subject area.

Set 3

This collection is organized by company name, so that the reviews of a particular company's products can be easily found.

None of the collections are individually indexed or otherwise referenced—there is simply too much material to do that!

The Process

Reviews come in many different formats; someone needed to scour three years of magazine back issues as well as locate those packaged in sets with various bindings. To compound the task, almost all reviews are printed with more than one review on a page. In order to make separate and uniform copies of each individual review, blank sheets of paper were cut, waxed in our production department so they would adhere temporarily, and then used to mask all parts of a page but the review being copied. The result? —three separate copies of each review for the three collections described above.

Keeping track of which reviews we had copied turned out to be a bigger problem than we had anticipated. We used two methods: we checked magazines on the front cover when copied, and we made up a matrix of sources (magazines) and months, checking the box when each issue was started (✓) and crossing it out (✗) when the issue was completed. We simply lined out months when no issue arrived.

Organization

We used the following subject areas for our Set 2 collection:

Art	Language Arts (2 binders)
Basic Living Skills	Library Skills
Business	Logic and Problem Solving
Computer Literacy	Miscellaneous
Computer Programming/ Utilities	Math/Advanced
	Math/Arithmetic (2 binders)
Counseling/Careers	Math/Statistics
Data Bases/Administration	Music
Early Childhood Education	Science
Foreign Language	Social Studies
Health/PE/Nutrition	Teacher Utilities

The title of each review was underlined as it was copied. If a subject area was given, it was also underlined; if not, the appropriate subject area was written on the review. This proved to be an enormous help, both for us and for teachers trying to locate a particular review.

We encountered obvious copyright problems. Because it is illegal to copy entire sets of materials, we contacted the sources of commercial reviews regarding our project, and most gave us at least verbal permission. We already subscribed to multiple copies of most of the magazines, and for one source we simply purchased two subscriptions. Besides the time commitment, this copyright issue is the major problem to resolve if you undertake a similar project. You should clear your intentions with all sources of commercial reviews you intend to include.

This project took a lot of time and over one box of paper! Two high school students who assisted in the Computer Center did the copying, sorting and binding. An adult supervised and answered category-related questions. It is estimated that the two students worked over 100 hours in the past year and a half. It now takes between two and four hours of student time a week to keep the review collection current.

The review collection has proved very useful to teachers who are involved in selecting or evaluating software. The ability to see all reviews within a single subject area in one place allows teachers to compare different programs, and also to get a good idea of the range of software available in that area. This project was voted one of the most useful services of the Computer Center by district computer representatives. END ■

[Glenn Fisher, Computer Specialist, Alameda County Superintendent of Schools Office, 313 W. Winton Ave., Hayward, CA 94544.]

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SOFTWARE ORGANIZATION

by
Leon Roland

Every school should organize information about its software collection to maximize use. There are three main ways such information may be accessed:

1. Listing of available programs with a short description can be made. Such a list is similar to bibliographies or reading lists typically available for teachers.
2. A key-word or subject-heading search of a data base can be done.
3. The software can be cataloged and cards prepared for addition to the library card catalog.

Three basic steps are required for any of these methods of organization: data collection, data storage and data retrieval.

Computer Courseware

Title: Crossword Magic Version: 3.2

Type: 0-Collection of 1-Game 2-Tutorial 3-Drill & Practice
4-Simulation 5-Problem Solving (6)-Utility 7-Data

Author: Sherman, Larry

City: Sunnyvale, CA

Source: L&S Computerware

Year Published: 1981 Dewey Number: 020

(Commercial) Public Domain Data Licensed Accession #: 215

Contents: Creates a crossword puzzle with your words and clues. Puzzle may be played on the screen or printed using the printer.

Sound: yes (no) Graphics: (yes) no

Color: yes (no) Printer: (yes) no

Cost: $49.95 Language: BASIC Grade: K-12

Disk: Floppy, 5¼sd Computer: Apple II

Accompanying material: user's guide.

System Requirements: 48 K; 3.3 DOS

Department: Teacher Rating 1 2 3 4 (5)

Subject Headings:

School: Lincoln Number programs: 1 Number disks: 1

Acquired: 1983 Vendor: Computer Store

During data collection, all necessary data to be used in the cataloging is acquired. Placing the material in a data base allows for efficient storage and retrieval of the information in the desired form. The information could be retrieved via printer or video display; some of the common printed forms used are labels, annotated bibliographies, title listings and card catalog cards.

Although all of these steps are necessary, the exact process will vary to meet each school's needs. The following are some ideas and methods of organization which can provide computer users in your school efficient access to the available software.

DATA COLLECTION

The data collected on each software package will depend on the amount of information a school wants to maintain. It is important to involve teachers, librarians and computer personnel in deciding what data should be collected. Figure 1 shows a data collection form. Remember, it is easier to collect too much data the first time than to find yourself needing to gather more information later.

Notes:

Title—Typically used as the main entry for the card catalog, because most teachers identify a program by title and because many programs do not supply the author's name. However, if the author's name is given, it is to be used as the main entry card.

Version—Necessary to determine if you have the updated or current version. Many programs are continually modified to eliminate bugs or to add options.

Type—If the program spans more than one type, the catalog can have extra entries, or simply list the predominant type and explain the format more completely under Contents. If a disk contains more than one program, such as MECC disks, it is best to catalog each program separately.

Source—The company producing the software, not the vendor. This may be needed if you need assistance with the material.

Accession number—Provides filing order as well as indicating the copyright status of the material. The accession number can include "C," "P," "D" or "L" to signify whether the software is Commercial, Public Domain, Data or Licensed.

Grade(s)—Often suggested on the package. If you must determine grade levels, keep the range broad.

Contents—Describes the software. Again, if a disk has more than one program, it is usually best to catalog each program individually. If not, then all of the programs contained on the disk should be listed. In cases where a disk has several programs that are all part of one system (for example, a data base with separate modules for entering, processing and printing the data), each module need not be listed as a separate program.

Computer—This information is important if the school has different computers, since software is often not interchangeable.

Material—Indicates items making up the package such as a user's guide or student worksheets. Teachers need to know about such materials in order to best utilize the program.

System—Refers to the memory size, DOS and other items such as a light pen needed to use the program.

Department—Used as a selection code if information is placed in a data base. A code such as "M" for mathematics or "L" for library might be used to allow the information to be

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selected from the data base. If you wish to be very precise in your coding, you could use "M10" or "M60" to code specific learning objectives.

Rating—Useful if the district has an evaluation policy, but sometimes difficult to assign. The catalog listing might include brief comments by users.

DATA STORAGE

Since the computer is an excellent information processor, it is logical to store the collected data in a data base. Many data base programs can maintain the needed files. Many of these programs will also allow you to produce bibliographies and other desired materials. A word processor can be used to store and produce these files. A specialized data base designed to handle only the cataloging of computer software may also be used. You should study these programs carefully, because they may require you to accept the method of cataloging and output designed by the developer.

The actual entering of data is not difficult once the data base is designed or selected.

DATA RETRIEVAL

The data file may be used for many different types of both printed and video output. However, most schools lack a sufficient number of terminals to use only video output and will require printed output. The four types of output presented in this article are directory, bibliography, labels and card sets.

Both the directory (figure 2) and bibliography (figure 3) formats include the program title and accession number. In addition, the bibliography contains a short description of the program, which may help some teachers determine the usefulness of a particular program.

Figure 2

Directory

```
Crossword Magic C 15
Grade Book # C 12
Library Overdue # C 10
```

Figure 3

Bibliography

```
Crossword Magic                          C 15
  Will  create a crossword puzzle using your words and clues.
  Created puzzle may be played on the screen or printed using
  the printer.

Library Overdue                          C 10
  Maintains a file of overdue books
```

The third type of output is a label for disks and other material contained in the package. Figure 4 shows a label made using a standard mailing label. The first line contains the accession number combined with a single letter (in this case, "C") indicating copyright status. The second line is the program name. The source is printed in the third line and the computer type is in line four. The last line contains system requirements. This label provides the basic information needed for filing and identification.

Figure 4

Label

```
C 15
Crossword Magic
L & S Computerware
Apple II
48K; 3.3 DOS; 5 1/4; ss/sd
```

Figure 5 shows a main entry card for a card catalog. (The cataloging process should follow the AACR 2 [Anglo American Cataloging Rules] recently developed for computer software.) In this example, the use of condensed print allows more information to be placed on one card and eliminates the need for multiple card entries. The MRDF in the upper left stands for Machine Readable Data Files. A complete set of cards may be made using the tracings given at the bottom of the card. The shelf list card can be changed so the cost and vendor of the software appears on that card.

Figure 5

Catalog Card

```
MRDF    Sherman, Larry
020       Crossword Magic / by Larry Sherman --
She       Version 3.2 --Sunnyvale, CA: L & S
C 15      Computerware, 1981.
          1 program file (BASIC, Apple II) on 1 computer disk; 5 1/4
        in. + user's guide.
          Utility program.
          System requirements: 48K, 3.3 DOS, printer.
            Disk characteristics: floppy disk, single sided, single
        density, soft sectored.
          Intended audience: K-12
            Summary: Creates a crossword puzzle using your words and
        clues.  Puzzle  may  be played on the screen or printed using
        the printer.
          I. Sherman, Larry. II. Title.
```

Although schools may use different forms or processes for collection, storage and output, the basic idea is the same. Efficient use of software (and other media resources) depends on easy access to the right information about the software. The media specialist can use a computer to organize this information and output it in convenient forms. Computer-generated bibliographies and catalog cards, as well as computer data bases, have an added benefit. Teachers and students can see, in a non-threatening way, how software can be used in specific subjects, along with the books and AV materials they've been using all along.

[The author has written a program for making bibliographies and will be happy to share this program, along with other public domain programs he has written, with ICCE Members for $5. Programs written for an Apple II+ or IIe, but the code is easily convertible. Leon Roland, Dept. of Science and Mathematics Education, Weniger 253, Oregon State University, Corvallis, OR 97331.]

Reprinted from The Computing Teacher, March 1985, Vol. 12 No. 6.

Software Copyright Interpretation

by
LeRoy Finkel

I have been asked to reconvene the ICCE Software Policy Committee so that we may examine the current state of the art (things in law tend to change over time) and review our current policies. As we prepare to meet, it seems appropriate to share with *The Computing Teacher* readers the best information we have regarding current interpretation of copyright laws.

There are no definitive answers to most of the questions we have, since the copyright law is vague in places and there have been no court cases to set precedent. Nevertheless, copyright attorneys, court watchers and lawmakers all seem to agree on how a court would interpret the current law if and when a case came before it. Not wanting to get sued and wanting to encourage software development by vendors, I prefer to take a conservative approach that looks to how the law will *likely* be interpreted, rather than waiting for the definitive decision by a court. In other words, I don't want to be the test case!! Do *you*? For those who doubt that publishers will sue a school district or teacher, be reminded that the American Association of Publishers did sue New York University, that a BOCES in New York was also sued (both public agencies lost their cases), and that while publishers may not sue, their professional associations seem willing and able to do so.

The issues:

1. **Back-up copies.** You are allowed back-up copies (number uncertain) that are to be used for archival purposes in the event your original copy fails. Such copies are *not* to be used on a second machine at the same time as the original. Since a backup is allowed by law, and if your vendor does not provide one or allow a process by which you can acquire one, then you may make one. But its *use* is restricted as stated above. Vendors who offer "multiple" back-up copies are using the term "back-up" incorrectly and have been asked to use the term "multi-copy discounts," which more accurately reflects what they are offering you.
2. **Multiple-loading or booting from one disk into multiple machines at the same time.** "In the absence of a license that explicitly permits you to do so," you would likely be in violation of the copyright laws if you loaded multiple computers with the contents from one disk for use at the same time. The legal concept has to do with the "proliferation of simultaneous users." The law is designed to protect the copyright holder from loss of sales. If *Bank Street Writer* is sold for use on one machine (and it is), and you load it into 15 machines, one after the other, so that all 15 are in use at the same time, you are inhibiting sales. Thus, you are in violation of the law. The fact that you *can* physically load the contents into multiple machines is irrelevant. The law does imply that sequential use on different machines is okay (first on one machine, turn it off, then on another machine). The key element here is proliferation of "simultaneous" users. That one concept has helped me out a lot. Two companies have recently announced simultaneous-use or multiple-loading software. They have been asked to emphasize that this is a special license for a particular piece of software. One solution to the multiple-loading "problem" is multi-copy pricing and licensing, an option more companies seem to be taking.
3. **Networks.** "In the absence of a network license" you would likely be in violation of copyright laws if you downloaded a program to multiple stations at the same time from your network, be it a hard disk or floppy disk network. The "proliferation of simultaneous users" concept described above would again apply. ***Whether it is physically possible to load the stations from the network is not germaine to this discussion. The absence of a license permitting simultaneous use is the copyright issue.***

It is not enough for districts to merely pass copyright policies—we must pay heed to them. It is the responsibility of each of us to be a role model to fellow teachers and students alike and allow only legal uses of software on our campuses.

If you have questions, comments or information for the committee, please write me. Since the law is somewhat different in each country, I would like to hear from people willing to serve on subcommittees for specific countries.

[LeRoy Finkel, San Mateo County Office of Education, 333 Main Street, Redwood City, CA 94063.]

1987 Statement on Software Copyright
An ICCE Policy Statement

Permission to reprint all or part of this document is granted. Please acknowledge the ICCE Software Copyright Committee.

Background

During 1982-83, educators, software developers, and hardware and software vendors cooperated to develop the **ICCE Policy Statement on Network and Multiple Machine Software.** This Policy Statement was adopted by the Board of Directors of the International Council for Computers in Education (ICCE) in 1983, and was published and distributed. It has received support from hardware and software vendors, industry associations and other education associations. One component of the Policy Statement, the "Model District Policy on Software Copyright," has been adopted by school districts throughout the world.

Now, three years later, as the educational computer market has changed and the software market has matured, ICCE has responded to suggestions that the policy statement be reviewed by a new committee and revisions be made to reflect the changes that have taken place both in the marketplace and in the schools.

The 1986-87 ICCE Software Copyright Committee is composed of educators, industry associations, hardware vendors, software developers and vendors, and lawyers. All the participants of this new Committee agree that the educational market should be served by developers and preserved by educators. To do so requires that the ICCE Policy Statement be revisited every few years while the industry and the use of computers in education are still developing.

Responsibilities

In the previous Policy Statement, lists of responsibilities were assigned to appropriate groups: educators; hardware vendors; and software developers and vendors. The suggestion that school boards show their responsibility by approving a district copyright policy was met with enthusiasm, and many districts approved a policy based on the ICCE Model Policy. The suggestion that software vendors adopt multiple-copy discounts and offer lab packs to schools was likewise well received; many educational software publishers now offer such pricing. It is therefore the opinion of this committee that, for the most part, the 1983 list of recommendations has become a *fait accompli* within the industry, and to repeat it here would be an unnecessary redundancy.

Nevertheless, the Committee does suggest that all parties involved in the educational computing market be aware of what the other parties are doing to preserve this market, and that the following three recommendations be considered for adoption by the appropriate agencies.

School District Copyright Policy

The Committee recommends that school districts approve a District Copyright Policy that includes both computer software and other media. A Model District Policy on Software Copyright is enclosed.

Particular attention should be directed to item five, recommending that *only one* person in the district be given the authority to sign software licensing agreements. This implies that such a person should become familiar with licensing and purchasing rights of all copyrighted materials.

Suggested Software Use Guidelines

In the absence of clear legislation, legal opinion or case law, it is suggested that school districts adopt the enclosed Suggested Software Use Guidelines as guidelines for software use within the district. The recommendation of Guidelines is similar to the situation currently used by many education agencies for off-air video recording. While these Guidelines do not carry the force of law, they do represent the collected opinion on fair software use for nonprofit education agencies from a variety of experts in the software copyright field.

Copyright Page Recommendations

The Committee recommends that educators look to the copyright page of software documentation to find their rights, obligations and license restrictions regarding an individual piece of software.

The Committee also suggests that software publishers use the documentation copyright page to *clearly* delineate the users' (owners' or licensees') rights in at least these five areas:

1. How is a back-up copy made or obtained, how many are allowed, and how are the back-ups to be used (e.g., *not* to be used on a second machine at the same time)?
2. Is it permissible to load the disk(s) into multiple computers for use at the same time?
3. Is it permissible to use the software on a local area network, and will the company support such use? Or is a network version available from the publisher?
4. Are lab packs or quantity discounts available from the publisher?
5. Is it permissible for the owner or licensee to make copies of the printed documentation? Or are additional copies available, and how?

ICCE—Suggested Software Use Guidelines

The 1976 U.S. Copyright Act and its 1980 Amendments remain vague in some areas of software use and its application to education. Where the law itself is vague, software licenses tend to be much more specific. It is therefore imperative that educators read the software's copyright page and understand the licensing restrictions printed there. If these uses are not addressed, the following Guidelines are recommended.

These Guidelines do not have the force of law, but they do represent the collected opinion on fair software use by nonprofit educational agencies from a variety of experts in the software copyright field.

Back-up Copy: The Copyright Act is clear in permitting the owner of software a back-up copy of the software to be held for use as an archival copy in the event the original disk fails to function. Such back-up copies are not to be used on a second computer at the same time the original is in use.

Multiple-loading: The Copyright Act is most unclear as it applies to loading the contents of one disk into multiple computers for use at the same time. In the absence of a license expressly permitting the user to load the contents of one disk into many computers for use at the same time, it is suggested that you *not* allow this activity to take place. The fact that you physically can do so is irrelevant. In an effort to make it easier for schools to buy software for each computer station, many software publishers offer lab packs and other quantity buying incentives. Contact individual publishers for details.

Local Area Network Software Use: It is suggested that before placing a software program on a local area network or disk-sharing system for use by multiple users at the same time, you obtain a written license agreement from the copyright holder giving you permission to do so. The fact that you are able to physically load the program on the network is, again, irrelevant. You should obtain a license permitting you to do so before you act.

Model District Policy on Software Copyright

It is the intent of [district] to adhere to the provisions of copyright laws in the area of microcomputer software. It is also the intent of the district to comply with the license agreements and/or policy statements contained in the software packages used in the district. In circumstances where the interpretation of the copyright law is ambiguous, the district shall look to the applicable license agreement to determine appropriate use of the software [or the district will abide by the approved Software Use Guidelines].

We recognize that computer software piracy is a major problem for the industry and that violations of copyright laws contribute to higher costs and greater efforts to prevent copying and/or lessen incentives for the development of effective educational uses of microcomputers. Therefore, in an effort to discourage violation of copyright laws and to prevent such illegal activities:

1. The ethical and practical implications of software piracy will be taught to educators and school children in all schools in the district (e.g., covered in fifth grade social studies classes).
2. District employees will be informed that they are expected to adhere to section 117 of the 1976 Copyright Act as amended in 1980, governing the use of software (e.g., each building principal will devote one faculty meeting to the subject each year).
3. When permission is obtained from the copyright holder to use software on a disk-sharing system, efforts will be made to secure this software from copying.
4. Under no circumstances shall illegal copies of copyrighted software be made or used on school equipment.
5. [Name or job title] of this school district is designated as the only individual who may sign license agreements for software for schools in the district. Each school using licensed software should have a signed copy of the software agreement.
6. The principal at each school site is responsible for establishing practices which will enforce this district copyright policy at the school level.

The Board of Directors of the International Council for Computers in Education approved this policy statement January, 1987. The members of the 1986 ICCE Software Copyright Committee are:

Sueann Ambron, American Association of Publishers
Gary Becker, Seminole Co. Public Schools, Florida
Daniel T. Brooks, Cadwalader, Wickersham & Taft
LeRoy Finkel, International Council for Computers in Education
Virginia Helm, Western Illinois University
Kent Kehrberg, Minnesota Educational Computing Corporation
Dan Kunz, Commodore Business Machines
Bodie Marx, Mindscape, Inc.
Kenton Pattie, International Communications Industries Association
Carol Risher, American Association of Publishers
Linda Roberts, US Congress—OTA
Donald A. Ross, Microcomputer Workshops Courseware
Lary Smith, Wayne County Int. Schl. Dist., Michigan
Ken Wasch, Software Publishers Association

For more information write to the ICCE Software Copyright Committee, ICCE, University of Oregon, 1787 Agate St., Eugene, OR 97403.

The Most Important Criteria Used By the Educational Software Evaluation Consortium

by
Gary G. Bitter and David Wighton

The Educational Software Evaluation Consortium is an organization of non-profit evaluation agencies which meets annually to share information and to produce an annual preview guide to quality educational software materials. Most of the agencies are associated either with state/provincial departments of education, regional agencies, or specific school districts. The 1985 membership consisted of the following 28 organizations:

Alberta: Department of Education
Arizona: Arizona State University Microcomputer Research Clinic
British Columbia: Ministry of Education
California: TECC Software Library and Clearinghouse
California Educational Computing Consortium
Library Media Consortium
Computer-Using Educators
Department of Defense Dependents Schools
EPIE Institute
Florida: Department of Education
International Council for Computers in Education
Illinois: Micro-Ideas
Indiana: Clearinghouse for Computer Education
Iowa: Micro Libraries
Louisiana: Department of Education
Maryland: Montgomery County Schools
Michigan: Michigan Association for Computer Users in Learning
Oakland Schools
MICROSIFT
Minnesota: Department of Education
New York: Department of Education
New York City Schools
North Carolina: Department of Education
Oklahoma: Oklahoma State University
Oregon: Center for Advanced Technology in Education
South Dakota: Department of Education
Texas: Education Computer Cooperative
Wyoming: Department of Education

Through the cooperative exercise of preparing each annual *Educational Software Preview Guide*, members of the consortium are able to assist each other in identifying products which might be potentially useful to educators in their regions. With each organization assessing a minimum of 100 products, the cumulative effect of sharing information results in a large number of products evaluated. For example, *The 1986 Educational Software Preview Guide* contained 573 product listings and was based on 4,822 separate assessments by consortium members.

As members come from different areas and as they represent organizations with varying purposes, it is not surprising that the methods of evaluation and the criteria on which these assessments are based also vary. During the discussions leading to the preparation of *The 1986 Educational Software Preview Guide*, members agreed that such variances were likely, but were curious as to the extent of these differences. In addition, the consortium members decided that it would be useful to identify those criteria which were most critical, to assist software evaluators in reviewing their own evaluation processes. The identification of these most important characteristics was also felt to be useful to the educational community at large. In effect, these represent a list of what are perceived by the majority of educational software evaluation agencies to be the most important characteristics of quality educational software.

The first part of the study consisted of a request to each member to submit "the 20 most important characteristics you use to evaluate software in your review process." Sixteen members responded and their 320 criteria were then examined for distinct characteristics.

We identified what appeared to be the most common criteria and 22 were selected. Criteria addressed in different ways by many members were grouped under general headings. For example, the general heading "user friendliness" was used to include such specifics as "sufficient information for program use," "directions are easy to follow," "user can move easily through the program," "on-screen instructions provided," etc.

From the 22 criteria a questionnaire was developed. Each consortium member was asked to rank order the 22 items from the most important criteria for judging educational software to the least significant at their selection site.

Eight-six percent of the consortium members rank ordered the items in the questionnaire. The results of the questionnaire were tabulated and an average rank score was computed for each response. The rank is as follows:

RANK	CHARACTERISTIC
1.	Correctness of Content Presentation—Is the program free from content, informational, computational, grammatical and syntactical errors?
2.	Content Presentation—Is the pedagogical content presented in a clear, concise, logical and manageable fashion and in sufficient depth of instruction and/or practice so that learning will take place?
3.	Use of Technology—Is this an appropriate use of computer technology, such that the program takes full advantage of the computer's capabilities and provides students with a learning experience that cannot be presented better in another media?
4.	Integration into Classroom Use—Can the program be effectively and easily integrated into classroom use? Does the software lend itself to use within a classroom time frame? Are effective and appropriate teacher support materials available? Can the program be easily used by a teacher?
5.	Ease of Use—Is the program user friendly?
6.	Curriculum Congruence—Does the content directly support the curriculum?
7.5	Interaction—Is interaction effectively achieved for the target audience? Is there a sufficient amount and a sufficiently high quality of interaction to promote learning?
7.5	Content Sequence/Levels—Are there multiple levels of difficulty with appropriate incremental steps between the levels, so that the development sequence and the difficulty of the levels is appropriate to the target audience?
9.	Reliability—Is the program free from programming and technical errors?
10.	User Control of Program—Can the user (student or teacher) control the rate, amount and sequence of presentation?
11.	Feedback (general)—Does the program correctly assess student input and provide appropriate and effective feedback messages?
12.	Objectives—Are objectives clearly stated, and are they met?
13.	Motivation—Is the program motivational?
14.	Branching—Are there branches to provide individualized instruction according to each student's needs?
15.	Negative Feedback/Help—Are corrective feedback messages or help screens provided as needed?
16.	Content Modification—Can the content be modified by the teacher?
17.	Content Bias—Is the content free from bias (race, sex, cultural, ethnic, stereotyping, violence)?

RANK	CHARACTERISTIC
18.	Teacher Documentation—Is the documentation comprehensive, easy to understand and well organized?
19.	User Support Materials—Are user support materials present? Where prsent, are they appropriate and effective?
20.	Color, Sound, Graphics, Animation—If these features are present, are they used effectively to enhance the program?
21.	Screen Displays—Are screen displays effectively and appropriately formatted?
22.	Management System—Is there a management system which provides an effective means for record keeping and/or assignment control?

Summary

The results indicate a strong emphasis on content and pedagogy versus computer-related characteristics. The first ranking was on **correctness** of content presentation, and the second choice was on **effectiveness** of content presentation. The third choice looked at the appropriate use of technology, then the fourth choice emphasized content again, with the integration of the program into the classroom.

Among the lower rankings was use of computer features such as screen displays, color, sound, graphics and animation, rated as 20 and 21. The question of a management system which provides an effective means for record keeping and/or assignment control was ranked lowest of the 22 most important criteria.

Many of the 22 items overlap and are difficult to rank-order. But it was obvious that ease of use and machine presentation have shifted from top priorities to assumed priorities. The emphasis is on pedagogy, integration and content.

We have since given this survey to inservice and preservice teachers and found a high correlation between the two groups. The number one choice varies, but the correlation is high.

Recommendations.

1. On the basis of these results, it is apparent that **software evaluation instruments need to emphasize content-related criteria.** Many of the checklist instruments and evaluation reports that were used several years ago seemed to emphasize technical questions. As a result, it was common to find reports that discussed program reliability, the use of color and graphics, etc., but little attention was paid to whether the pedagogical content had been appropriately developed.
2. Teachers need to **focus software review on the "educational" half of the term "educational technology."** Five of the top eight criteria relate to the pedagogical content of the program. Is the content accurate? Is it presented in a clear and concise manner with sufficient depth of instruction? Does the program's content support the curriculum? Is the sequence of activities appropriate? All of these questions measure the *educational* value of the product—an emphasis that is gratifying to see. Teachers can now evaluate software in relation to the curriculum and pedagogy.
3. **More research needs to be done to determine the most effective computer feedback which can be provided to the learner.** Whether the computer provides effective feedback is difficult to determine. Interaction, feedback, user control, branching and corrective feedback are all important for developers and reviewers to consider.
4. Teachers, reviewers and developers of software should first **consider sound pedagogical principles.** The content should be clearly and accurately presented, with sufficient depth of instruction and practice within a sound developmental sequence. Software should make the interaction easy to achieve and meaningful; allow the user to control appropriate parts of the learning activities; use branching to meet individual needs; and provide more assistance to a learner having difficulty than just the presentation of the correct answer. Obviously the developer needs to involve more teachers and curriculum specialists in the planning of software programs.
5. **The curriculum is now the issue** in software and teachers can be helpful in the review process. Software evaluation is time consuming and teachers need to be given release time to provide input into software selection.

[Gary Bitter, Division of Curriculum and Instruction, College of Education, Arizona State Univ., Tempe, AZ 85287; and David Wighton, Wighton CAI Services Ltd., #204, 5104-82nd Ave., Edmonton, Alberta, Canada T6B 0E6.]

For information on membership in the Educational Software Evaluation Consortium, contact Ann Lathrop at the San Mateo County Office of Education, 333 Main St., Redwood City, CA 94063.

The 1987 Educational Software Preview Guide *is available from ICCE, University of Oregon, 1787 Agate St., Eugene, OR 97403, for $8. In addition to* ***The 1987 Educational Software Preview Guide,*** *the publication also includes articles on software selection, evaluation and management.*

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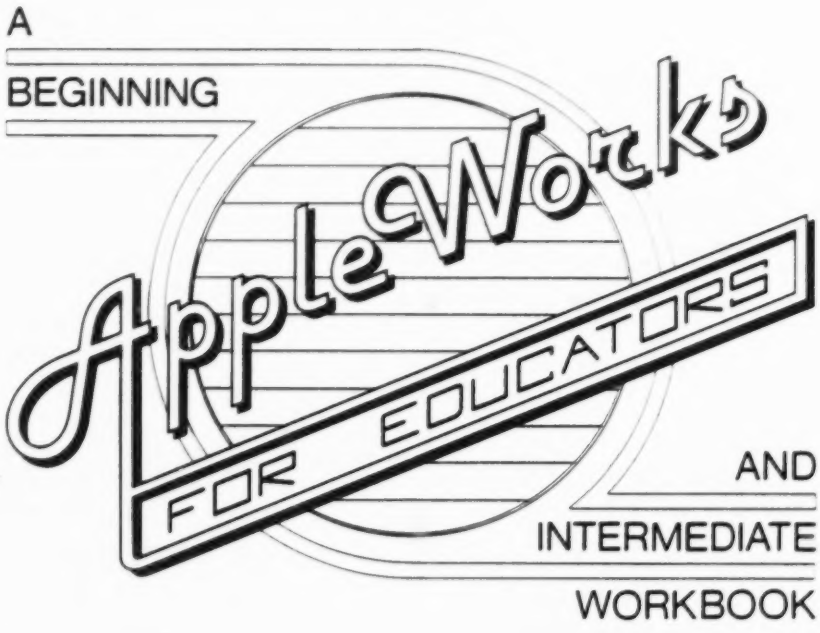

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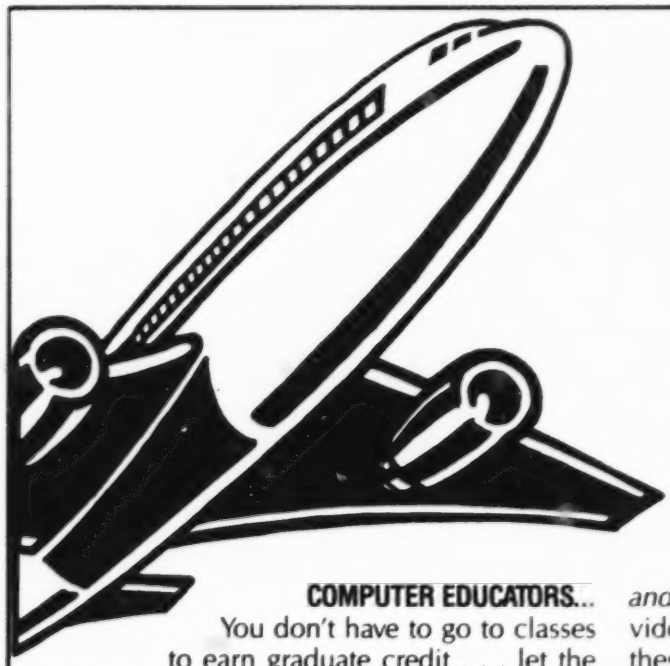

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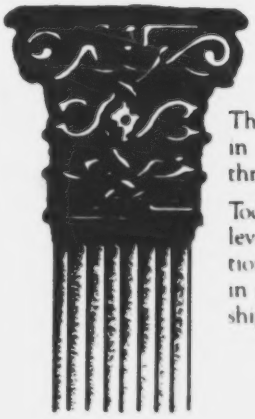

About ICCE

The International Council for Computers in Education was founded by Dr. David Moursund in 1979 as an organization that would foster appropriate instructional use of computers throughout the world.

Today ICCE is the largest professional organization for computer educators at the precollege level. It is nonprofit, supported by 14,000 individual members and more than 50 organizations of computer-using educators worldwide. These organizations are statewide or regionwide in scope, averaging 500 members each. Approximately 84% of ICCE's individual membership is in the United States, 12% is in Canada, and the remainder is scattered around the globe.

About *The Computing Teacher*

ICCE publishes *The Computing Teacher* journal. *The Computing Teacher* provides accurate, responsible, and innovative information for educators, administrators, computer coordinators, and teacher educators. The journal addresses both beginning and advanced computer educators through feature articles, columns, software reviews, and new product and conference listings. Contributors to *The Computing Teacher* are leaders in their fields, consistently providing the latest information in computer education and applications.

Publications, Special Interest Groups

In addition to *The Computing Teacher*, ICCE provides a number of publications to computer-using educators. ICCE's Special Interest Groups provide in-depth information for computer coordinators, teacher educators, computer science educators, and Logo-using educators. *C.A.L.L. Digest* is published nine times per year for ESL teachers. ICCE committees address a variety of ethical and practical issues important to the computer-educating community.

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